This document describes the **Technology 2000** initiative, describes in detail the governor's 1994 funding proposal, and reports the legislative outcome.

This document also provides a status report on the electronic highway, measures progress in relation to national electronic highway initiatives, and describes Utah's implementation plans. These plans include efforts currently underway to re-invent state government so that it will adapt to new electronic methods of government service delivery.

Technology 2000 is a broad, multi-faceted initiative designed to propel Utah to leadership in development and application of advanced information technology for state government, public and higher education, citizens and private businesses. It will help achieve the goals of the administration in providing world-class education, improving the business climate, adding higher paying jobs, enhancing the quality of life, and improving the efficiency and productivity of state government. Ultimately, the promise of the telecommunications revolution is to empower individuals so they can control their own lives, prepare for the world of work, enjoy lifelong learning, and support their families.

The governor proposed $32.83 million in funding in the 1994 legislative session to aggressively move Utah toward achievement of these goals. The money will allow the state to move dramatically ahead in distance learning and in providing electronic services to citizens.

Contributors

This document results from the efforts of many contributors. For that reason, this document's cover does not include an authorship source reference. Instead, it is produced by and for the State of Utah, and is so titled. The document is updated every sixty to ninety days by the State Information Technology Coordinator, Governor's Office of Planning and Budget by analyzing and consolidating information from many sources. The most significant contributors have been:

Governor's Office / Governor's Office of Planning & Budget, State of Utah

US West Communications Inc.

Division of Information Technology Services, Department of Administrative Services, State of Utah

The Independent TELCO Association of Utah

The Utah Education Network, State of Utah

Many documents, such as meeting minutes, from the many Utah State Electronic Highways Task Force committees.

Many documents downloaded off the INTERNET such as meeting minutes of the National Information Infrastructure Task Force.

All the other Technology 2000 project contributors: Legislators, Task Force Members, Agency Information Technology Departments, Utah's citizens, and many, many others.

Information technology will change the way we live, work and learn. Futurists believe we are entering a revolutionary new era in society. The societal changes that will occur as a result of the information age will be as great as the changes sparked by the industrial revolution.

The enormous computer, television and telephone industries are merging into one. And as they are merging, their products and networks are becoming smaller, cheaper, faster and less expensive. Some experts have said if similar progress had occurred over the last 20 years in automotive technology, today you could buy a Lexus for about $2. It would travel at the speed of sound, and go 600 miles on a thimble of gas.

Information technology was once an obscure part of business and government. Today, it is the most exciting part of business and government with the potential to revolutionize our systems and processes, making them more efficient and productive.

At the beginning of his administration, Governor Mike Leavitt empaneled an electronic highway task force to:

1 Encourage and facilitate the use of advanced technology within education and state government to improve efficiency and productivity of classrooms and state agencies.

2. Further state government's efforts to better serve its customers, including the business sector, by providing electronic services and allowing citizens and business people to interact with state government more efficiently.

3. Encourage and monitor the development of technological infrastructure necessary to provide these services and to serve the private sector.

The year of work by the task force has culminated in the governor's **Technology 2000** initiative.

TECHNOLOGY 2000

Several of the specific applications of **Technology 2000** are described in this document. But they are all dependent on progress in two very basic and key areas: 1. Continued expansion and development of **UtahNet**, the state's wide area network. 2. Development of an advanced governance structure to coordinate all the state's technology efforts and drive forward the technology agenda.

UTAHNET

Goal: Create a wide area network with the speed and capacity to provide interactive, full-motion video, audio, graphics and data.

To avoid excessive costs, duplication and citizen confusion, the state's information technology applications, including those for education and citizen services provided by state agencies, should run on a unified high-capacity network, called **UtahNet**. A citizen or business person should be able to access **UtahNet** either by dialing into it (toll-free) with a computer and modem, or having it on-line full-time with a dedicated line. When someone accesses **UtahNet,** a screen should come up featuring a far-ranging menu or table of contents of government and educational services.

Much of **UtahNet** is already built. Using U.S. West's frame relay technology, the network already has more than 6,000 computer devices connected to it in agencies all across the state. Most state workers are presently able to communicate electronically, sending documents and messages through E-Mail. Anyone connected to **UtahNet** can access a variety of state databases, bulletin boards and the INTERNET. A variety of software is available through the network. The network allows agencies to work off the same databases. For example, job training functions are carried out by a number of different agencies. It makes sense, however, for a job training client to have only one electronic file, accessible by all the agencies, to see that the client's needs are properly handled without overlap and duplication.

Nearly 500 new computer devices are being added to **UtahNet** each week as more agencies and offices come on line. Soon, Utah will have the largest frame relay network in the world. As public and higher education computer devices are added to **UtahNet**, the number of users on the network will grow to 100,000. The addition of health care facilities, businesses and individual homes will add many thousands more.

UtahNet is based on frame relay technology, which packages data together and speeds it up and down the network "cloud" at 1.544 megabits per second. A very important feature of **UtahNet** is that it positions us perfectly for the future. Using the frame relay technology allows the state to relatively easily advance the network to the next level of bandwidth, Asynchronous Transfer Mode (ATM), which will allow speeds and capacities on the "cloud" 100 times to 1,000 times that of frame relay. These gigabit speed levels will allow interactive full-motion video with multiple channels, giving Utah the optimum electronic highway. At that point, other state video networks such as EdNet can be merged with **UtahNet,** providing a seamless electronic highway with enormous potential for government and educational services, law enforcement, and entrepreneurial

activity.

Discussions are currently underway with private providers such as U.S. West, TCI, Electric Lightwave, to bring ATM technology to Utah as quickly as possible, with the lowest rates possible for education and government.

TECHNOLOGY GOVERNANCE

Goal: Develop a governance structure to ensure that all government entities are cooperating, and avoiding duplicative expenditures and redundant networking.

A great paradox exists in the development of advanced information technology applications. Such development can have an enormous democratization and decentralizing effect by breaking down monolithic organizations and getting information and decision-making abilities out to the masses. But in government, this effort must be centrally coordinated or enormous redundancies and overlap can occur, resulting in higher costs and duplicative networks.

In higher education, for example, advanced technology will allow any institution to offer any class to anyone living anywhere in the state. Without central coordination, the result will be a confusing morass of networks, classes and degrees, many of which may not be accepted at other institutions. Without central coordination, the same confusion will occur in state agencies as they develop electronic services and allow access to databases.

Part of **Technology 2000** is creating a new governance structure for information technology that will coordinate the state's technology efforts, drive forward the technology agenda, and undertake ongoing strategic planning. This is critical to the success of the initiative and to avoid overlapping, duplication of effort, and redundant networks. Entities that must be involved in the governance structure and agree to participate include the executive branch of state government, the judicial branch, the legislature, public education, and higher education. Much coordination must also occur with local governments, including libraries, law enforcement, and health departments.

In the last year, the administration has made enormous strides in coordinating all information technology expenditures and efforts in the state. The State Information Technology Coordinator has fulfilled the statutory duties of the office by compiling the state information technology plan, critiquing information technology plans of state agencies, approving and coordinating information technology expenditures, and preparing an annual report to the governor and the Legislature.

But much more than that, the State Information Technology Coordinator and the Governor's office have, for the first time in history, gotten all technology groups in government and the private sector talking and cooperating. For the first time, the Utah Education Network (UEN) and the Utah Division of Information Technology Services have reached an agreement to cooperate in developing the network over which educational and governmental services and applications will be delivered (See attached letter).

With encouragement from the governor's office, higher education is doing a much better job of coordinating network development and distance learning offerings from all the institutions. The Utah Education Network has been designated as the overall networking and distance learning coordinating body for both higher education and public education. The UEN is moving forward rapidly to expand distance learning and bring electronic education services for both instruction and administration to schools throughout the state.

In the executive branch, all networking and technology expenditures are being carefully monitored and coordinated. All electronic delivery of services, access to state databases, and electronic interaction with businesses and citizens will be centrally coordinated, rather than allowing each agency to do these things independently.

Even with the tremendous progress that has been accomplished in the last year, the governor and executive branch recognize that central coordination and oversight of all technology functions in the state need to be strengthened further and that a permanent governance structure needs to be put in place.

It is the recommendation of the governor that this issue be a major focus of study during the interim. The study could be led by the Legislature's proposed Information Technology Commission, which is expected to be created during this session. In the meantime, the governor's office and the state Information Technology Coordinator will continue to oversee and coordinate advanced technology developments.

Effects of the Electronic Highway

Nationally

Sociological Effects:

In the past two hundred years, the US has transitioned through various improved methodologies of information exchange. Significant historical information exchange technology transition points of the past were implementation of the transcontinental Pony Express mail delivery system in 1860 to exchange information; implementation of the transcontinental telegraph system in 1869 to exchange information; implementation of the telephone network to exchange information; implementation of one way radio broadcasts to exchange information; and implementation of one way television broadcasts to exchange information. The next one is at our doorstep: the national electronic highway.

Economic Effects:

The US Computer Systems Policy Project estimates that the national electronic highway initiative will create as much as $ 300 billion annually in new sales across a range of industries. The US Economic Strategy Institute estimates that accelerated deployment of the national electronic highway will increase the US gross domestic product by $194 to $321 billion per year by the year 2007, while simultaneously increasing productivity by twenty to forty percent.

Effects in Utah

Utah currently ranks second in the world as the largest computer software development center. In addition to the giants, such as the newly merged Novell / WordPerfect corporate group, Utah has an additional 1,350 information technology related businesses "on the way up". In 1992, Utah's information technology businesses generated $ 4.9 billion in annual industry revenue.

A national $ 300 billion annual increase in sales produced by the electronic highway initiative will produce substantial economic effects in Utah because of the concentration of information technology business in Utah.

Status of the Electronic Highway Infrastructure in Utah

US West Communications has already installed an extensive high bandwidth fiber optic network in Utah. Right now, this fiber network inter-connects the major population areas of Utah between Logan in the northern part of the state to Provo in the southern end of the valley. This existing US West fiber optic network also runs from Wendover eastward to Park City. US West has invested $141.3 million in electronic highway infrastructure in Utah, and plan to invest an additional $20 million per year from now on to cover anticipated growth.

Independent communications companies have also already installed fiber optic network infrastructure and end-point connections across many of Utah's rural regions, and they are continuing to quickly hook up other parts of the state. In many cases, Rural Electrification Grants (REA) have made fiber networks available first in the outlying rural areas before the urban areas are inter-connected to the electronic highway. All the fiber networks installed by the independent communications companies are inter-connected to the US West fiber network and the national electronic highway. The independent telephone companies of Utah have invested $116 million for electronic highway infrastructure.

By October 1994, US West will complete installation of high bandwidth fiber infrastructure throughout the rest of its service area in Utah, all the way from Provo to St. George along I-15. (See the attached map on the next page)

This fiber network will include end-point inter-connection (electronic highway on-off ramps) to all state, county and local government sites, universities, colleges, and libraries. In 1994, forty high schools will be completed with end point connections to the electronic highway. Forty additional high schools will be added each year for the next four years. All middle schools will also be connected to the electronic highway.

US West will convert to ATM technology dependent on customer requirements. They are currently conducting ATM technology trials in Utah, and will have limited deployment of ATM by the end of 1994. US West anticipates general deployment of ATM in the 1995-1996 period.

Status of End Point Connection to Utah Residences and Businesses

On March 16, 1994, US West announced a $160 million first phase of the high bandwidth fiber end point installation program to connect businesses and residences to the electronic highway in Utah. This initial phase includes 160,000 residential and business customers in the Salt Lake valley area. The electronic highway end point connection site selection process was based on economics and market surveys which focused on those customers most inclined to use multi channel cable TV viewing services (those most likely to sit and watch cable TV). (See the attached map).

1994-95 FUNDING PROPOSALS AND LEGISLATIVE RESULTS

In the 1994 legislative session, the **governor proposed $32.86 million** to propel the **Technology 2000** initiative dramatically forward. Most of the money will be used to expand distance learning, to train teachers and professors, to purchase computer hardware and software for public schools and higher education, and to link more schools and higher education institutions into **UtahNet.**

The 1994 Legislature **approved $29.33 million** for new information technology projects as follows:

PUBLIC EDUCATION

Amount RequestedAmount ApprovedExplanation of Need for Amount Requested$ 9.0 Million One Time$ 6.750 Million One Time

Note: The Legislature reduced the amount by $2,250,000.Request was to complete the $60 million ETI commitment started several years ago with a $9 million appropriation to Public Education. The funds would be allocated according to existing formulas and criteria. A portion of the ETI funds would be used for training.$ .019 Million Ongoing$ .019 Million Ongoing

For the School for the Deaf and Blind for networking and to link into **UtahNet**$ .30 Million One Time$ .10 Million SupplementalFor the Office of Rehabilitation Comp. System$ 1.35 Million One Time$ 1.25 Million WNLOP

Note: The Legislature reduced amount by $100,000.For the WNLOP program for Applied Technology Center MIS system.$ .35 Million One Time$ .25 Million One Time

Note: Amount reduced by $100,000.To link ATCs into **UtahNet.**$ .645 Million Ongoing
$ 3.0 Million One TimeThis $.645 Million was not approved, but the $.645 Million was approved by the Legislature to come from the New Technology Initiative (NTI) amount approved.

$ 3.0 Million One Time was approved.

$ .007 Million On-Going funding was also approved for a growth factor.
For continued EDNET expansion according to the EdNet plan$ 5.0 Million Ongoing$ 5.25 Million One Time

Note: This is an increase of $250,000 over the amount requested, but the $645,000 for EDNET is supposed to come out of this money.

This is a net reduction between the two categories of $400,000 by the Legislature.To link 250 public schools (all high schools and middle schools) into **UtahNet**, according to a schedule and criteria developed by ITS, the Utah Education Network and Education Technology Initiative officials. The money will be used for hardware, software, training, line charges, INTERNET access fees, and administrative costs. (See detailed explanation on attached sheet.) This expansion will also allow easier access to **UtahNet** by libraries, county and city governments, health clinics, etc.$ .20 Million One Time $ .10 Million One Time Note: This is a reduction of $100,000.ATC Brigham City Coop Training Center$ .10 Million One Time$ .10 Million One Time Office of Rehabilitation Independent Living Program$ 0$ .600 Million One Time. Note: The Legislature added $600,000 one-time for a USOE computer system.USOE Computer System. Note: This item was not requested by the Governor's Office but was added by the Legislature.**$19.96 Million$17.43 Million Total for Public Education**

HIGHER EDUCATION

Amount RequestedAmount ApprovedExplanation of Need for Amount Requested$ 1.0 Million$ .75 Million

Note: The Legislature reduced the requested amount by $250,000.Complete the $60 million ETI commitment started several years ago with a $1 million appropriation to Higher Education. The funds would be allocated according to existing formulas and criteria. A portion of the ETI funds is for training.$ .355 Million$ .350 Million Note: Reduced by $5,000.For campus fiber optic networks.$ .010 Million$ .010 MillionOCHE EDNET site.$ 5.0 Million One Time
$ 3.0 Million Ongoing$ 5.35 Million One Time

$ 2.5 Million BondFor Higher Education New Technology Initiative. The funding use will be determined by the governing committee, for:
1. Faculty training and development in electronically enhanced instruction.
2. Distance learning course development (90 core courses)
3. LIBNET expansion.
4. Technologically enhanced classrooms.
5. Science/technology equipment / Higher Ed ETI.$ .25 Million Ongoing$ .25 Million One TimeApplied technology funding statewide initiative.**$ 9.615 Million$ 9.05 MillionTotal for Higher Education**
All distance learning offerings will be centrally coordinated through the Utah Education Network, in which all institutions will participate. This will prevent confusion, redundant offerings, turf battles and duplicative expenditures for technology.

Institutions will prepare courses and offer classes (via the UEN) through a Request for Proposal (RFP) process. All electronically-delivered classes will be listed in all college and university class catalogs, community education listings, public education catalogs, and other appropriate publications. Credit earned from distance learning must be accepted by any state college or university.

GENERAL GOVERNMENT

Amount RequestedAmount ApprovedExplanation of Need for Amount Requested$ .0515 Million$ .0510 Million Ongoing

Note: Reduced $5,000.Technology Enhancements for Public Service Commission, Department of Insurance.$ .06 Million Ongoing
$ .06 Million One Time$ .06 Million Ongoing
$ .06 Million One Time

Electronic Business Service Capability (BBS) for Department of Community & Economic Development. $ 0$ .0238 Million Ongoing

Note: The Legislature added this item.LAN Connection Fees (DCED Administration).$ .0031 Million Ongoing$ .0031 Million OngoingFor Hispanic Computer Bulletin Board (DCED)$ .0547 Million
$ .027 Million Ongoing

Note: Legislature reduced the Technical Support Specialist funding by $27,700.

For a Technical Support Specialist for the Board of Pardons and Parole.$ .03 Million Ongoing plus $.10 Million in one Time funding$ .10 Million Ongoing Video Teleconferencing equipment for Utah Board of Pardons. $ .10 Million in One Time funding$ .10 Million Ongoing Document Imaging System for Utah Board of Pardons. $ .0332 Million Ongoing$ .0332 Million OngoingElectronic Monitoring Equipment for Youth Corrections$ .230 Million Ongoing$ .250 Million Ongoing

Legislature approved $20,000 more than requested.Implement Legislative Auditor's information technology enhancement recommendations at Division of Facilities & Construction Management (DFCM), DAS.$ .900 Million Ongoing$ .900 Million OngoingFor the FIRSTplus systems integration project, the new state government accounting system. (State Division of Finance)$ .250 Million Ongoing$ .060 Million Ongoing
$ .10 Million One Time

Note: The Legislature may have approved another $100,000 ongoing funds.For the Automated Geographic Reference Center (AGRC), Division of Information Technology Services.$ 0$ .160 Million OngoingFor Utah Healthline and Health Data Improvements. (Department of Health)$ .050 Million Ongoing$ .050 Million OngoingFor Division of Purchasing FIRSTplus enhancements.$ .157 Million Ongoing$ .117 Million OngoingFor Department of Public Safety information technology enhancements (DNA Analysis, INTEL support, etc.).$ 0$ .400 Million Ongoing

Note: The Legislature added this $400,000 itemNew Offender Based Tracking Computer System for Department of Corrections.$ .0645 Million One Time$ 0.

Note: Legislature did not fund this project.For Department of Agriculture gas chromatograph, whole grain analyzer technology.$ .0439 Million One Time$ .0439 Million One TimeHardware (database server, LAN work station, software license upgrades) needed for the Industrial Commission's systems integration project.$ .2337 Million One Time$ .15 Million One Time

Note: Legislature reduced requested funding $ 83,700.For Department of Insurance's systems integration project. $ .020 Million One Time$ .020 Million One TimeFor Public Service Commission's imaging system.
$ .2842 Million One Time$ .120 Ongoing
$ .2242 Million One Time

Note: Request was reduced $60,000.State Library network expansion. (DCED)$ .300 Million One Time$ 0.
Note: The Legislature did not fund this project.For Department of Administrative Service's compressed video equipment.$ .022 Million One Time$ 0.
Note: The Legislature did not fund this project.For National Guard FIRSTplus equipment purchases.$ .230 Million One Time$ .200 Million One Time

Note: Legislature reduced this by $30,000.For Department of Commerce Imaging System**$ 3.27 Million$ 2.055 Million Ongoing**
$ .798 Million One Time$ 3.27 Million$ 2.853 Million General Government Total

BUSINESS AND CITIZEN SERVICES

Another area of critical importance in **Technology 2000** is the development of citizen and business services. The governor asked for $60,000 in supplemental funds and $60,000 in ongoing funds to put state government at the fingertips of citizens and business people.

A task force is working to make state government accessible electronically to citizens and businesses who have a computer and modem. Within a year, a number of electronic services will be available. The goal is to make interacting with state government far easier, more convenient and less costly than it is today. Many services that now require citizens to travel to a government office can be handled electronically. Examples are: Renew a drivers' license. Purchase a fishing license. Look up job listings. Incorporate a business. Check a list of licensed day care providers. Review court rulings. Monitor progress at the Legislature. All can be done from a home or office. A single local phone number will connect every Utahn to numerous services and databases.

Together, these proposals will within a few years create the equivalent of a community college in every high school in the state, extend distance learning to thousands more students, reduce the pressure to spend more

on traditional bricks and mortar infrastructure, extend the services and benefits of **UtahNet** to rural areas, provide better opportunities for telecommuting to reduce freeway congestion and pollution, improve health care and reduce costs, spawn an explosion of entrepreneurial activity, and position Utah to prosper in the global marketplace.

Technology 2000 funding will continue on a multi-year basis, with contributions from the general fund, bonding, tuition, local contributions, federal grants, and private grants. Agencies and public and higher education must begin to find money for technology within their existing base budgets and capital budgets, rather than always ask for new funding. The state cannot continue to invest in the infrastructure of the past at the same rate as usual and also invest in the infrastructure of the future. Eventually, proper use of technology should slow the growth of funding for bricks and mortar, travel and transportation, and even personnel.

Utah began its electronic highway initiatives with the election of Governor Mike Leavitt in 1992. Shortly after Governor Leavitt took office in January 1993, he established an **Electronic Highway Task Force for the State of Utah**.

Utah's electronic highway initiatives need to correlate with the national electronic highway initiatives. These were described in the *National Information Infrastructure: An Agenda for Action* issued by the US government in September 1993.

At the national level, the efforts to implement the NII for the federal government is managed by the **Information Infrastructure Task Force (IITF)**.

The IITF has three main sub-groups: (1) the **Telecommunications Policy Committee**, (2) the **Information Policy Committee**, and (3) the **Committee on Applications & Technology**. These committees are composed of various representatives of US government agencies. The IITF is advised by the **US Advisory Council on the NII**, which consists of high level industry, labor organization, and federal, state, and local government executives.

In addition to the NII Task Force committees listed below, the **National Telecommunications and Information Administration (NTIA) of the US Department of Commerce** also works on NII related issues, such as NII grants, etc.

US Advisory Council on the National Information Infrastructure - NII stakeholder representation forum. Membership consists of industry, labor, academia, public interest groups, and representatives from state and local governments. (This is a separate and different group than the High Performance Computing Advisory Committee).

US Information Infrastructure Task Force (IITF) - articulates the Administration's vision for the NII. Membership consists of high level representatives of US government agencies.

IITF Subcommittees:

1. Telecommunications Policy Committee - will formulate a consistent Administration position on key telecommunications issues. Chaired by Larry Irving, head of the National Telecommunications and Information Administration of the US Department of Commerce.

The Working Group on Universal Service - will work to ensure all Americans have access to the NII benefits.

The Working Group on International Telecommunications Policy - will work on international telecommunications issues.

2. Information Policy Committee - addressing critical information policy issues that need to be addressed to deploy the NII. Chaired by Sally Katzen, head of the Office of Information and Regulatory Affairs, US OMB.

The Working Group on Intellectual Property Rights - is developing proposals for copyright protection in an electronic world.

The Working Group on Privacy - is developing individual privacy policies for the electronic world.

The Working Group on Government Information - is developing ways for improved electronic dissemination of government information.

3. Committee on Applications & Technology (CATS) - coordinates Administration efforts to develop, demonstrate, and promote NII applications in manufacturing, education, health care, government services, libraries, and other areas. Chaired by Arati Prabhakar, Director of the National Institute of Standards and Technology. This committee works closely with the High Performance Computing and Communications Program.

The Working Group on Government Information Technology Services (GITS) - is coordinating efforts to improve IT use by government agencies.

To simplify tracking of the NII initiatives and correlate national initiatives with Utah's initiatives, the following table was created. This table is updated by the Utah State Information Technology Coordinator as of the version date of this Technology 2000 document.

NII Action Agenda **United States Results** **Utah's Results**1. Establish an inter-agency information infrastructure task force.Created the **US Information Infrastructure Task Force (IITF)** that articulates the Administration's vision for the NII. Membership consists of high level representatives of US government agencies. Also, created three **IITF sub-committees:**

1. **Telecommunications Policy Committee.**
2. **Information Policy Committee.**
3. **Committee on Applications & Technology (CAT).**

On January 25, 1994, CAT issued draft of *What it Takes to Make it Happen: Key Issues for National Information Infrastructure*.Utah's equivalent is the **Information Technology Policy & Strategy Committee (ITPSC)** , which previously existed as the ITRC but was amended to include additional representation from the Legislative & Judicial branches, Higher Education, and Public Education. Inter-agency coordination is technically supported by the **Information Technology Managers Committee (ITMC),** and several other ITPSC subcommittees. 2. Establish a private sector advisory council on the NII.Created the **US Advisory Council on the National Information Infrastructure** that represents NII stakeholder. Membership consists of industry, labor, academia, public interest groups, and representatives from state and local governments. (This is a separate and different group than the High Performance Computing Advisory Committee).Created a comprehensive **Electronic Highway Task Force** that represents Utah state's NII stakeholders. The EHTF consists of about 40 EHTF subcommittees. Membership composition includes representatives from industry, academia, public interest groups, and representatives from state and local governments.3. Strengthen and streamline NII related policy making agencies.The **Information Technology Process Review Committee** ensures continuous improvement.

Utah H.B. 68S2 was passed by the Utah State Legislature and will establish the new **Utah State Information Technology Commission**. This new oversight group will expand coverage of IT issues to include the executive, legislative, and judicial branches of Utah state government, including higher education, and public education.4. Reform communications legislation to promote private sector investment.New proposed federal legislation proposes:

1. Establishing an optional "Title VII" FCC category and new rules covering all types of electronic communications.
2. Opening local telephone services to competition from cable, long distance, and electric utility companies.
3. Allowing the RBOCs to compete in long-distance and video programming markets.
4. For 5 years, restricting the RBOCs from acquiring cable companies within their local service areas, with exceptions for rural areas.
5. Allowing the RBOCs to enter electronic-publishing and equipment-manufacturing markets through affiliates, with certain restrictions.
6. Requiring providers to interconnect and make broadcast bandwidth available to other providers and consumers.
7. Granting the FCC authority to ensure that cable companies provide others with access to "on- ramp" connections.
8. Establishing a Federal / State Joint Board to make recommendations to the FCC and grant to the FCC rule making authority to ensure universal service. Governor Leavitt's State of the State speech January 17, 1994 indicated Utah will create a similar level playing field for telecommunications service providers in the Utah market.

Utah is tracking federal legislation to add section VII to Federal Communications Act. Utah is also tracking H.R. 3636, S.1086, and H.R. 3626 for any state action that might be needed.5. Revise tax policies to promote private sector investment.Signed into law new tax incentives for private sector investment in R&D and new business formation.Utah's state income tax laws follow federal income tax laws. When the US government implements tax law changes, they are automatically implemented concurrently at the State level.6. Develop a new concept of universal access for the NII.Created **The Working Group on Universal Service**, a subcommittee of the Telecommunications Policy Committee.
(Also see item 4 above).This is a federal government only issue and Utah does not need to take any action.7. Continue to fund R&D projects designed to create more powerful computers, faster computer networks, and more sophisticated software.FY94 US Budget includes the following investments in technology:

$1.1 billion for the High-Performance Computing and Communications Initiative.

$40 million for NII related project research by the Department of Energy's National Labs.

$472 million for ARPA-led Technology Reinvestment Projects (TRP) for NII related projects.Utah's FY95 Budget, the first submitted within the NII initiative time frame, includes the following investments in NII technology:

In addition to the normal annual IT expenditures of $73 million per year, an additional $29.33 million is planned for expenditure in FY95 for information technology resources.

8. Implement an NII pilot projects program by providing grants to state and local governments, health care providers, school districts, universities, and other non-profit entities.FY94 US Budget includes investments in technology:

$100 million has been designated to develop NII applications in education, manufacturing, health care, and digital libraries.

$50 million of NTIA grants for NII applications for non-profit institutions.

In March 1994, NTIA, Dept of Commerce announced a $26 million competitive grant opportunity. See item No. 7 above.

Utah has organized a **State-wide Federal Grant Committee** to monitor federal NII grant offerings and process grant application.

The SITC / GOPB is processing NII grant requests before the May 12, 1994 application receipt deadline at the NTIA offices. 9. Inventory NII application projects to identify how government can effectively use the

NII.1. On September 7, 1993, the US government issued the *National Performance Review* (NPR) document which identified a number of ways to use IT to cut costs ($5.4 billion) and improve government services. US government agencies organized "change action teams" to implement NPR recommendations.

However, in December 1993, the US GAO indicated that these IT related NPR recommendations / proposed savings were not realistic and the GAO did not agree with any of them. The GAO strongly noted that successful implementation was highly dependent on successful deployment of IT and information systems and that most US government agencies simply did not have the capacity in terms of management skills, management continuity, and technical ability to develop the fundamental underpinnings needed to implement the recommendations. They also noted that the NPR report offered no comprehensive implementation plan for addressing this basic shortcoming in a reasonable time frame.Utah organized committees of **EHTF User Groups** for developing NII service implementation plans for:
1. **Citizen Services**.
2. **Healthcare Services**.
3. **Education Services**.
4. **Business Services**.
5.**Government Effectiveness and Efficiency**.
10. Review and clarify the standards process to speed implementation of NII applications.Created a **Cross Industry Working Team (XIWT)**, headed by the **Corporation for National Research Initiatives**, to develop a common NII architecture. White papers to be released in February 1994.The SITC, ITS, and ITPSC determine which national and international standards will be implemented for Utah state government.11. Review and reform government regulations that impede development of NII services.See item 4 above.See item 4 above.12. Review privacy concerns and issues of the NII.Created **The Working Group on Privacy**, a subcommittee of the IITF Information Policy Committee. Meetings were held January 10-11 and 26-27, 1994 to develop draft *Code of Fair Information Practices for the NII.* Utah implemented a **EHTF Privacy & Security Group** to develop implementation plans for these issues. Previous to this, a state-wide **Utah Security Users Group** already existed and studied these issues as it affects Utah state government.13. Review encryption technology and policies. (This issue deals with federal restrictions on using currently available encryption technology that would reduce the ability of intelligence agencies to eavesdrop)This is a federal government only issue and Utah does not need to take any action.14. Work with industry to improve network reliability.15. Streamline allocation of the radio frequency spectrum.
Signed the ***Emerging Telecommunications Technology Act*** which freed up radio spectrum.This is a federal government only issue and Utah does not need to take any action.16. Promote market principles in radio frequency spectrum allocation.Signed the ***Emerging Telecommunications Technology Act*** which implemented this concept.This is a federal government only issue and Utah does not need to take any action.17. Examine the adequacy of copyright laws to adequately protect intellectual property rights while simultaneously promoting use of the NII.Created the **Working Group on Intellectual Property Right**s, a subcommittee of the IITF Information Policy Committee18. Examine ways to electronically identify and reimburse copyright owners for electronic access to copyrighted material via the NII.19. Improve coordination with state and local officials, especially in NII related regulatory issues.20. Open up overseas markets to promote equal opportunity to export telecommunications products.This is a federal government only issue and Utah does not need to take any action.21. Eliminate barriers caused by incompatible standards.**Cross Industry Working Team** (XIWT), headed by Corporation for National Research Initiatives, developing common NII architecture. White papers to be released in February 1994.The SITC, ITS, and ITPSC determine which national and international standards will be implemented for Utah state government.22. Examine international and US trade relations and their effect on competitiveness of the US telecommunications industry in a global market.This is a federal government only issue and Utah does not need to take any action.23. Improve the use of information technology by government.

See item No. 9 above.

Created **The Working Group on Government Information Technology Services (GITS)**, a subcommittee of the IITF Applications Committee. GITS held meetings December 16, 1993 and January 12, 1994, and defined their mission, vision, and charter.The Governor has challenged Utah's leaders to:
- be willing to change, to restructure and re-invent its processes;
- focus more on technology and less on bricks and mortar;
- think specifically of ways to deploy technology to increase productivity and provide easier access to state information and services to citizens;
- make available electronically the enormous amounts of information state government colleges; and
- encourage a strong competitive environment among private communications companies that are providing the basic infrastructure for the information highway.

23 a. Develop mechanisms to deliver government benefits electronically.

i. **Electronic Service Access.**

Utah created the **Bulletin Boards Committee, Citizens Services Committee, Education Services Committee, and several Government Services Subcommittees,** all subcommittees of the EHTF Task Force, to develop implementation plans for electronic access to government services.

In January 1994, ITS established a state bulletin board system (BBS) which now makes available electronically hundreds of state documents. Other information is available on INTERNET Gopher servers. The Courts system implemented an electronic bulletin board that allows tracking legal cases in progress.23 a. Develop mechanisms to deliver government benefits electronically.

ii. **Electronic Payments**.
Utah's Dept. of Human Services is implementing a pilot project in July 1995 to deliver food stamp benefits electronically.

A **Smart Card Committee** has been established and met to discuss inter-agency cooperation on a universal access card for state government services.
23 a. Develop mechanisms to deliver government benefits electronically.

iii. **Electronic Data Interchange**.
The September 7, 1993 *National Performance Review* document recommended implementation of EDI systems in federal government procurement practices. The December 1993 GAO report concurred and noted "We agree that automated technologies can be used to facilitate computer to computer exchange of routine information and that such a capability could play a key role in greatly improving the federal government's business operations and processes, including procurement of products and services. The GAO noted that effective implementation of EDI systems would help reduce the burdens of the paperbased process now imposed on business and government and could increase small business participation in the procurement process. The GAO noted experience implementing EDI within large private sector companies and the Department of Defense shows that effective EDI implementation requires (1) business plans that
clearly define how the technology will benefit the targeted business areas, (2) using a standard approach that concentrates on consistent electronic business forms for each business area,
and (3) a corporate-wide telecommunications infrastructure to support electronic business within the agency and with external
trading partners.Although Utah has been laying the groundwork for an EDI network system in a manner similar to the desired method as noted by the US GAO, Utah state government does not presently have EDI capability.

Utah state government has been implementing consistent use of a standardized forms methodology throughout the
organization by standardizing on use of WordPerfect's InForms product.

Utah has also been implementing a corporate-wide telecommunications infrastructure throughout the organization by implementing and inter-connecting Novell NetWare LANs and WordPerfect Office throughout the organization.

However, Utah is also presently implementing a new governmental accounting and procurement system, FI-NET, throughout most of the organization. This system is based on the version 8.0 of the Government Financial System (GFS) product marketed by American Management Systems Corp. (AMS). Version 8.0 of GFS does not provide EDI functionality. AMS is adding ACH vendor payment functionality in their new version 9.0 of the GFS product, which Utah will install when available. A future version of GFS may implement full EDI capability. 23 b. Improve Law Enforcement / Public Safety Networks.Utah organized a **Task Force on Wireless Mobile Communications (800 MHz)** to develop an implementation plan, cost estimates, and funding requests.23 c. Implement Government wide Electronic Mail.In April 1993 issued a preliminary report and in November 1993 issued a final report, "*A Unified Federal Government Electronic Mail Users Support Environment*" (M.U.S.E. Report) which is the US government's E-mail vision document. It is a vision of an infrastructure to support NPR / NII recommendations.

The M.U.S E. report contains functional statements of what is needed to migrate the US government's delivery of services now using the paper mails to delivery via the electronic mode of operation known as electronic mail. In February 1993, Utah's Governor directed state agencies to implement E-Mail. Actual implementation quickly followed the directive. Utah state government standardized on use WordPerfect Office for E-Mail.

As of January 1994 all state agencies are inter-connected using 100 LANs. Of these 100 LANs, 18 are using the newest E-Mail software: WordPerfect Office for Windows 4.0. The other 82 LANs are using WordPerfect Office 3.1, and plan to convert to version 4.0. Approximately 9,400 state government employees are presently interconnected with E-Mail. Utah state government also has 115 **UtahNet** sites connected to the INTERNET, which inter-connects 10,000 networks of about 10 million world-wide users. **UtahNet** service to schools, libraries, and local governments is also underway.24. Improve the accessibility of government information.1. Created **The Working Group on Government Information**, a subcommittee of the IITF Information Policy Committee.
2. On June 28, 1993, issued OMB Circular A-130 to encourage agencies to increase citizen access to public information. OMB Circular A130, entitled "*Management of Federal Information Resources*," establishes policy that Federal agencies will follow when acquiring, using, and distributing government information. OMB A-130 provides that, generally, the Federal government should recoup only those costs associated with the dissemination of information, and not those associated with its creation or collection. Similarly, it provides that agencies should not attempt to restrict the secondary uses of their information products. In addition, the Freedom of Information Act is being updated to include electronic records.
3. The President and Vice President announced that the White House is now accessible via electronic mail.
4. The US government also has selected information available on several INTERNET Gopher Servers.Utah state government information is generally determined by GRAMA, the Government Records Access Management Act, if such data is not specifically prohibited from disclosure by agency statutes. GRAMA allows a governmental entity to charge fees for duplicating or compiling a record in a form other than that normally maintained. GRAMA encourages free access to information when release of the record primarily benefits the public and not an individual, when the individual is the subject of the record, or when the requestor's legal rights are affected by the record.

For other conditions, the Governor challenged state agency managers to make available electronically other information state government collects.

In January 1994, Utah state government implemented free Bulletin Board System (BBS) access to state government information. As soon as state agencies can add data to be BBS, it is being added. The State also plans additional INTERNET Gopher Server access to state information.25. Upgrade the infrastructure for the delivery of government information.1. Investment to date for upgrading Utah's electronic highway infrastructure (fiber backbone) is $257.3 million by US West and the Independent TELCO Association of Utah.

2. An incentive rate system is used to promote agency use of the **UtahNet**.

3. About 100 state agencies are inter-connected on NetWare LANs. Also, 18 of 100 state agency LANs are now using the state-of-the-art WordPerfect Office 4.0 for Windows product.26. Enhance citizen access to government information.Issued OMB Circular A-130 to encourage agencies to increase citizen access to public information.

Also see item No. 24 above.1. Utah implemented a **Business Services Committee** and a **Bulletin Boards Committee** to identify issues and develop implementation plans.27. Strengthen inter-agency coordination

through the use of electronic mail.See item 23 (c) above. See item 23 (c) above.28. Reform the technology procurement process to make government a leading-edge technology adopter.For several years, Utah state government has been a leading edge technology implementor.

UTAH'S ELECTRONIC HIGHWAYS TASK FORCE (EHTF)

Mission Statement

To create electronic highways for rapid communications and processing of usable and useful information to enhance the quality of life for the people of Utah.

Goals and Objectives

1. Use the electronic highways to achieve the Governor's goals and objectives:
   - world-class education
   - quality jobs/quality business climate
   - better government
     - customer-service oriented
     - increase productivity
   - quality of life
   - fostering self-reliance
2. Provide leadership that will develop cooperative efforts to achieve EHTF objectives.
3. Foster an environment where investment in, and use of, electronic highways is affordable and economically reasonable.
4. Recommend regulations to protect the privacy and security of information.
5. Position Utah for universal connectivity to pubic and private networks.
6. Recognize and define user needs and provide education assistance to meet those needs.
7. Create a vision of uses of the electronic highways and communicate through education and marketing.
8. Create a clearinghouse of services and solutions for the general public and government.
9. Define and design the systems of the electronic highways.
10. Position Utah to be included in federal funding for technology initiatives.

Composition

Strategy & Policy Group

- This group developed the EHTF mission and objectives.

Transport Group

- Telephone, cable, cellular, radio communications, private networks, satellite, INTERNET, and State Network Group.

Privacy & Security Group

- Utah Security Users Group

Tools / User Interface Group

Users Group

- **Citizen Services**
  (ITPSC and sub-committees also work on providing Citizens Services - see next section.)
- **Healthcare Services**
  - Utah Health Information Network Executive Committee
  - Standards Committee
  - Technical Committee
  - Telemedicine Interest Group

- **Education Services**
  - Utah Education Network
    - EDNET - Library / Data Services Committee
    - EDNET - Instructional Television / Video Services Committee
    - Education Network Consortium
    - The International Network for Education & Technology
  - Utah Educational Technology Initiative Steering Committee

- **Business Services**
  - Business Services Committee
    - High Productivity Resource Centers
  - The Utah Partnership for Educational & Economic Development
    - Research Committee
    - Network Subcommittee
    - Board of Trustees Executive Committee
    - Education and Training Committee
    - Partnership Development Committee
    - Business Advisory Council
    - Public Awareness and Communications
    - Resources Committee
  - Freenet - Community Involvement

- **Government Effectiveness & Efficiency**

  - Information Technology Policy & Strategy Committee (formerly the ITRC)
    - State of Utah Information Technology Managers Committee
    - Electronic Mail Administrative Committee
    - 800 MHz (Radio & Mobile Data Communications) Committee
    - Geographical Information System (GIS) Advisory Committee
    - Bulletin Boards Committee
    - Compressed Video Committee
    - Utah Law on Disc Committee
    - Folio Publisher's Group
    - State of Utah LAN Administrators NetWare Users International Committee
    - INTERNET Committee
    - Courts Committee
  - Information Technology Process Review Committee
  - State Network Committee

Utah State Government IT Divisions / Sections

- Department of Administrative Services
  - Division of Information Technology Services (ITS)
  - Information Technology Section, Division of Finance, DAS
    - Technical Team, FIRSTplus Project
  - Computer Control, Risk Management, DAS
  - Administration, Division of Facilities Construction & Management (DFCM), DAS
  - Department of Administrative Services Advisory Committee (DMTAC)
- Administrative Services, Department of Agriculture
- Data Processing, Alcoholic Beverage Control
- Programming Administration, Attorney General
- EDP Audit, Utah State Auditor

- Data Processing, Department of Commerce
- Data Processing, Department of Community & Economic Development
- Management Information Services, Department of Corrections
- Information Technology, Administrative Office of the Courts
- District Computer Services, Utah State Office of Education
- Data Processing, Employment Security / Job Service
- Data Processing, Department of Environmental Quality
- Data Processing, Financial Institutions
- Bureau of Information Technology, Department of Health
- Data Processing, Department of Human Resource Management
- Bureau of EDP, Department of Human Services
    - LAN Steering Committee
    - PACMIS Steering Committee
    - USSDS Steering Committee
    - ORS Steering Committee
    - PC User Group
    - Windows User Group
- Technical Support, Industrial Commission
- Programming Administration, Department of Insurance
- Data Processing, Legislative Research & General Counsel
- Technical Support, National Guard
- Data Processing, Department of Natural Resources
- Management Information Services Division, Department of Public Safety
- Technology Management Division, Utah State Tax Commission
- Information Systems, Utah Department of Transportation

EHTF CommitteeResponsibilityEHTF Strategy & Policy Group
Sets overall direction for the Task Force. Developed mission statement and goals and objectives for the Electronic Highways Task Force. Coordinates and correlates task force activities. **EHTF Transport Group**Those who will provide the physical infrastructure for the electronic highways

- Telephone
- Cable
- Cellular
- Radio Communications
- Private Networks
- Satellite
- INTERNET
- State Network Group**EHTF Privacy & Security Group** (Utah Security Users Group)Promote the confidentiality, integrity, and availability of the state's information technology resources.**EHTF Tools / User Interface Group**Develop and implement a strategy that will allow the electronic highways work groups to collaborate electronically. **EHTF Users GroupsEHTF Users GroupsCitizen Services Committee**The electronic delivery of citizen services will make services available 24 hours a day at the citizen's convenience. Services should be ultimately an integrated, seamless delivery from all levels of government. Key groups in focusing on these issues are the ITPSC, ITMC, and intergovernmental coordinating groups. **Healthcare Services Group**Electronic Data Interchange (EDI) offers great promise in cutting the burgeoning administrative costs of Healthcare. Telemedicine and the delivery of healthcare services electronically can do much to improve healthcare quality. **Utah Health Information Network (UHIN) Executive Committee**
This consortium of healthcare providers, third party payers, and others interested in healthcare issues have made good progress defining a mission and standard necessary to accomplish EDI. Its mission is to provide the consumer of health care services with reduced costs, improved health care quality and access, and facilitate research by:

1. Creating and managing an electronic value-added network to link the health care community participants in the State of Utah for the purpose of interchanging important financial and clinical information.

2. Standardizing health care transactions and health care reporting, electronic interface development, and communication services.

3. Gathering and providing a state-wide data repository.**Utah Health Information Network Standards Committee**This committee has met for the past fifteen months and has pioneered many of the issues necessary for detailed consensus to allow EDI to become a reality in Utah. It works closely with national committees that recognizes this committee is a leader in dealing with standards issues. **Utah Health Information Network Technical Committee**This committee is a technical advisory committee to the UHIN effort.**Utah Telemedicine Interest Group**This group was formed in November with Dr. Jan Root, Director of Local and Rural Health for the State, to bring together parties interested in improving health care for citizens throughout the region in a cost effective manner by developing Telemedicine capacity and assuring that the rural and under served populations receive the benefits of this technology.**Education Services Group**Educational services will be provided by Higher Education and Public Education. The Governor has asked the Utah Education Network, in an expanded form, to coordinate these efforts.**Utah Education Network**The Utah Education Network exists to provide a quality instructional and informational service by harnessing telecommunications technology in the service of education for the benefit of Utah learners. The Network does this by planning, constructing, maintaining, managing, and programming the state's non-broadcast education systems (EDNET, ITFS) broadcasting stations (KULC-TV Channel 9 and the daytime schedule on KUED-TV Channel 7), on behalf of Utah's systems of higher and public education and state government. Network staff also provide leadership, advice, and advocacy to educators and public officials in the field of telecommunications.**EDNET - Library / Data Communications Committee**Coordinates the work of developing a library data network (the Electronic Library Data Service).**EDNET - Instructional Television / Video Services Committee**Provides programming (data, library, courses, the ITV schedule, etc.) for Public Education, for the development of broad curriculum offerings and "the Electronic High School".**The International Network for Education & Technology (INET)**INET is an independent, non-profit, educational corporation establishing a new, multi-media information technology based, educational paradigm.

INET was formed to demonstrate the power, cost effectiveness, and productivity of collaborative efforts to develop learner-directed, performance based, interactive multimedia computer / TV based educational systems. **Education Network Consortium**A group of critical associates who network together on technical networking topics for K-12 schools. Created under the leadership of ETI.**Education Technology Initiative (ETI) Steering Committee**This group brings together the major stakeholders in education; public schools and colleges of education, business and industry, and the technology community in support Utah to a world class education environment. **Business Services Group**This group will provide improved business services to Utah and other business. Recognizing the interdependence of education, business and government, Utah has developed an infrastructure that will enable efforts.**Business Services Committee**Develop an electronic information repository that will include electronically available items such as information on key state government programs, information technology plans and uses, state and local government planning, state finances, state budgets, state agency missions, objectives, and outcome measures, GOPB's annual publications, state demographic and economic data, and other information.**The Utah Partnership for Education & Economic Development Research Committee**Promote fundamental and applied research at Utah's universities and industries to support expansion of high technology business. They established the following goals:
D.1. Expand cooperative university and business research efforts.
D.2. Enhance education through research and other opportunities.
D.3. Increase research capabilities of faculty and private sector researchers.
D.4. Enhance research infrastructure.**The Utah Partnership for Education & Economic Development Network Subcommittee**This committee is identifying and dealing with issues relating to the delivery of electronic services to businesses.**The Utah Partnership for Education & Economic Development Network Subcommittee - FREENET - Community Involvement**This group is looking at the issues of how FREENETS can help the objectives of the electronic highway through the grassroots involvement of citizens. Utah County has an effort underway.**Information Technology Process Review Committee**This committee is reviewing the IT approval process in the State to ensure continuous improvement. **State Network Committee**This group was brought together in October 1993 to begin to build a vision and consensus of an optimum network for the State of Utah. **Information Technology Policy & Strategy Committee (ITPSC)** (was formerly the ITRC)A high-level forum for state government IT issues with representatives from the executive, legislative, and judicial branches, higher education, and public education. The ITPSC is an advisory committee that reviews and approves IT policies, rules, standards, and guidelines developed by the SITC staff, ITS, ITPSC subcommittees, state agencies, or other sanctioned groups. The ITPSC is the sanctioning body for multi-agency IT projects or groups, and serves, if necessary, as an appeal forum to SITC decisions.**State of Utah Information Technology Managers Committee**Group includes one member from each state agency (IT Manager) plus representatives from Public Education, Courts, the SITC staff, and the Legislature. Group discusses more technical state-wide information technology issues than those covered by the ITPSC.**Electronic Mail Administrative Committee**To propose and recommend electronic mail standards and policies that promote the use of electronic mail to improve communication within Utah state government. **Governor's Task Force on Wireless Mobile Communications - 800 MHz** Define the migration path that will replace existing land mobile radio technology with the next generation of radio services. The goal is to develop a 800 MHz network that will support both voice and data applications and accommodate the current and future needs. The projected system will support cities, counties, and state agencies and associated medical services. The committee has defined 32 specific objectives to be accomplished.**Geographic Information System (GIS) Advisory Committee**A committee of state and local government representatives actively involved in geographical information system (GIS) activities.**Desktop Purchasing Advisory Committee**Group promotes the sharing of information concerning state-wide procurement of desktop PC products.**Bulletin Boards Committee**ITS has brought up a bulletin board as of January 1994. This is available to everyone on **UtahNet** and through dial in lines. It needs to be enabled for INTERNET access. GOPB online, ITS online, DCED's Utah Forum will be available soon. Each agency will have responsibility for information available on the Bulletin Board System (BBS). It is a beginning for single point of access (538-3383) for public inquiry into the state's data repository.**Compressed Video Committee**Develop a plan for the successful implementation, operation, and coordination of media conferencing in cooperation with the University of Utah EDNET system. This network will link major government and educational facilities throughout the state of Utah to promote world class education and improve government efficiency and productivity by providing distance learning, Teleconferencing, video arraignment and other applications.

The committee will coordinate the development of media conferencing to minimize duplication while providing the needed services to all governmental and higher educational entities at the lowest possible cost while maximizing effective and efficient utilization of media resources. **Utah Law on Disc Committee**This group with representatives from Executive, Legislative, and Courts meets monthly to coordinate issues concerning Utah Law on Disc.**Folio Publisher's Group**Comprised of representatives from state agencies that publish or plan to publish Folio infobases for distribution.**State of Utah LAN Administrators NetWare Users International Committee**To promote and maintain coordination and communication among Utah state government LAN Administrators. This group promotes the exchange of ideas, research, and the implementation of information technologies to improve networking, communications, and integration. The group also functions as a unified voice to technology and support providers.**Courts Committee**This information was derived from *Toward Paperless Utah Court*s (September 28,1993)] In 1991, the **Utah Judiciary Commission on Justice in the Twenty First Century** established the following:

Short Term Goals (1 to 5 years):

The courts should permit the initiation of any case by electronic filing from remote locations.

Long Term Goals (5 to 10 years):

1. Records in all courts should be automated and should be electronically retrievable by the bar, other governmental agencies, the public, and the media from remote locations, subject to appropriate protection for privacy, confidentiality, and security interests in keeping with existing constitutional and statutory requirements.

2. Imaging systems should replace or supplement present filing systems in all courts of record.

3. The judicial system should move to an essentially "paperless" court.**Utah Security Users Group**This group focuses on information systems security issues and promotes the confidentiality, integrity, and availability of the state's information technology resources.

EXECUTIVE SUMMARY

The purpose of the plan is to advance education and government services in the State of Utah by providing complete access to video, audio, radio, wireless, multimedia and data services. The Utah Electronic Highway will be accomplished by promoting reliable technologies and ensuring sites selected for service are prepared for connection.

This plan will outline the steps needed to enhance Utah's Electronic Highway providing education, government, and business opportunities throughout the state for improved effectiveness and efficiency.

Background

The Division of Information Technology Services (ITS) provides voice, data, video, and wireless communication services to State government agencies and other political entities throughout the State.

- **UTAHNET** - Presently the Division has approximately 100 Frame Relay connections operating at 1.544 Megabits throughout the state growing at a rate of approximately 5 additions per week. **UtahNet** connects State agencies statewide allowing access to diverse databases on the mainframe, LAN to LAN connectivity, access into the INTERNET, and statewide E-mail communications.
- VOICE NETWORKING - ITS provides voice communications for approximately 18,000 telephone sets throughout the state. This is accomplished by deploying PBX, Key systems, Centrex lines, and dedicated telephone lines such as a 1FB connected to a sophisticated network comprised of Common Carrier high speed T1 and state owned digital microwave links.
- WIRELESS SERVICES - ITS also supports 2-way radio communications, E-911 dispatch centers, cellular telephone, and paging service statewide for State agencies and Public Safety.

The Utah Education Network (UEN) provides instructional programming through its many services, KUED, KULC, Instructional Television Fixed Services (ITFS), EDNET microwave and compressed video, and the UEN data network.

- ≅ KUED and KULC broadcasts K-12 instructional programming Monday through Friday in support of the Utah State Office of Education.
- ≅ KULC broadcasts college credit telecourses, evenings and weekends, sponsored by the state's universities and colleges.
- ≅ ITFS broadcasts continuing education for medical professionals located in the Salt Lake Valley.
- ≅ EDNET microwave and compressed video networks, provides the distribution of K-12 and college credit courses via an interactive statewide video and audio system.
- ≅ UEN provides leadership and support for educational network applications.

Menu of Electronic Highway Services

The Electronic Highway will provide access to government and educational services on a local, state, national, and international level.

Technology Based Courses

A combination of fully interactive, one-way video and two-way audio, and prepackaged instructional modules on videocassette, CD ROM, and laser disk which include services such as...

- ≅ Courses like Science, Math, and Language
- ≅ Concurrent Enrollment and Advanced Placement Courses
- ≅ Advanced Placement Courses
- ≅ College Credit Courses and Degree Programs
- ≅ Remedial and Vocational Studies
- ≅ Staff Development
- ≅ Community-based Services (such as telecourses on parenting, day-care provider training, English as a second language, and government services)

Administrative Teleconferences and Training

A combination of fully interactive and one-way video/two-way audio teleconferences which include *services such as...*

- ≅ Administrative Meetings
- ≅ In-Service Training
- ≅ Curriculum Development
- ≅ Community-based Services (such as teleconferences on parenting, day-care provider training, English as a second language, and government services)
- Remote Court hearings and arraignments
- Corrections and parole hearings
- Human Service interviews

Computer Services

Fully interactive, on-line services supplemented with CDROM, laser disk, mainframe and supercomputers, LAN to LAN connectivity, UTAHNET access, and other prepackaged services available to all state agencies and educational facilities which might include access and services such as...

- ≅ Statewide Telemedicine Services
- ≅ Highway Traffic Control Centers and Services
- ≅ Libraries
- ≅ INTERNET
- ≅ Research Data Bases
- ≅ Telecourse Teachers
- . The USOE Curriculum Server and Statewide Resource Server
- . Statewide Computer Networks
- . On-Line Services
- . Administrative Data Processing
- . Supercomputers
- . City, County, State, and Federal Government Services & Data Bases
- . EDNET Management System
- ≅ State Bulletin Boards
- ≅ Employment Information

Public Safety Services

Promote and enhance quality of life issues including E-911, 2 way radio communications and the statewide digital microwave. Some of the services offered include...

- . Support for E-911 dispatch centers
- . Consolidation of Public Safety Communications including dispatch and radio networks
- . Support of Emergency Medical Communications services through the EMS grant program
- . Providing redundant network services on the state microwave system
- . Operate and maintain the statewide microwave system including repeaters and base stations for 2-way radio communication
- . Planning for the implementation of a statewide 800 MHz network for government wireless services including mobile radio and mobile data terminals
- . Representing Utah with National Associations on issues affecting the FCC and wireless technologies (PCS/PCN)

Voice Communication Services

Provide a cost effective statewide voice network promoting the shared use of facilities to minimize long distance and maximize access while providing state of the art technology. Some of the services available or planned are...

- Automated Call Directors (ACD)
- Call Management Systems (CMS)
- Voice Mail
- Interactive Voice Response (IVR)
- Toll Tandem Switching to minimize long distance charges
- Auto Attendants
- ISDN (Within certain Common Carrier exchanges)
- PBX and Key Systems from State Contract
- Voice System Maintenance
- Building Wiring
- Call Accounting and SMDR
- Automated Billing

Network Leadership

The Utah Electronic Highway will foster coordination and cooperation among all political subdivisions, institutions of higher education, public school districts, regional service centers, applied technology centers, city, county, state and federal government agencies and business.

Network Standards

Network standards will be continually updated and distributed to ensure interoperability between local, statewide, national, and worldwide networks.

- Provide users with guidelines and standards (video, voice, wireless, wiring, and data networking) to ensure the understanding of the requirements necessary for connection and the successful use of application services.
- Provide video, voice, wireless, wiring, and data networking standards.
- Coordinate the implementation of technology and applications to ensure the local infrastructure effectively integrates into global networks.

Training and Support

Training and support will be provided to the end users to meet a variety of different needs.

- Ensure all users are prepared to utilize the technology by coordinating training and support services available through the Utah Education Network, the Division of Information Technology Services, private enterprise, and various educational agencies within the state.
- Develop funding strategies for training and ongoing support of technology and applications.

Promoting the Utah Electronic Highway

Improve the quality of life in Utah and ensure access to all citizens.

- Select and implement network services that are efficient, flexible, synergistic, and cost-effective.
- Push the boundaries of new technologies, partnering with users and private enterprise to promote and utilize innovative solutions.
- Promote economic growth in Utah, providing incentives for rural and urban development through the expansion of the electronic highway.
- Make network services accessible to all citizens of the state.
- Promote the public's welfare through comprehensive Public Safety support and technological advancements in communications.

Implementation

The Utah Electronic Highway will provide a timely, flexible connection to meet the needs of every user.

Site Selection and Prioritization

Provide voice, video, wireless, and data services upon meeting an approved site selection criteria and as resources permit. Potential sites for service include; Higher and Public Education; Applied Technology Centers; High Schools, Middle Schools, Elementary Schools, Libraries; Government Agencies; Traffic Control Centers; and access to Homes and Businesses.

- Educational entity site selection and prioritization will be based upon the UEN Site Selection Process. This process will also be coordinated with ITS and the state agency prioritization process to maximize the use of available facilities.
- Site selection for educational entities will be approved by the Utah Education Network Steering Committee.
- Site selection and prioritization for state government agencies will be based upon needs assessment and timing of infrastructure availability. This process will also be coordinated with the UEN technical staff.
- Available and planned technologies will be matched to each user's needs, being prepared to adjust services as their needs change.
- Available resources from government, education, and private enterprise will be coordinated in implementing Technology 2000.

Management and Support of UtahNet

*Provide efficient and reliable services to manage and support the **UtahNet** backbone.*

- Provide and support a video Technical Operations Center (TOC).
- Utilize and expand the Network Control Center (NCC) to provide remote diagnostics and management capabilities.
- Implement and maintain network delivery systems based on the most effective mix of private, leased, and shared facilities allowing for flexible bandwidth expansion.
- Provide remote access into a network management system allowing remote monitoring and administration.

Utilize Existing Resources

Continue to enhance and support existing and new services based upon users needs through existing technologies where it serves the state's interest to do so.

Educational Services

Broadcast television, via KUED and KULC, provides the most cost effective service of distribution of one-way video and audio throughout the state. Until a new and expanded technology and service can be implemented, KUED and KULC will continue to bridge the gap in providing educational services to the state.

- Continue to expand and upgrade the state wide translator system. KUED services 95% and KULC services 80% of the states population.
- Provide and maintain the endsite infrastructure for receiving and distribution of KUED and KULC to the classroom.
- Coordinate with the cable companies to ensure the distribution of educational broadcast services to the home.

Instructional Television Fixed Services, (ITFS), provides one-way distribution of instructional video and audio programming to the medical community in the Salt Lake Valley.

- Expand the ITFS service by providing instructional video services to schools, government and business in the Salt Lake Valley.
- Provide and maintain endsite infrastructure for receiving and distribution of ITFS services.

EDNET Microwave and Compressed video network provides a two-way interactive service, connecting Higher Education, Applied Technical Centers, and High Schools.

- Provide microwave production sites with guidelines necessary to produce instructional programming for statewide distribution.
- Use the existing analog microwave services to deliver live instructional programming for distribution on KUED or KULC.
- Continue to support the use of the T1 compressed video network in providing distance learning opportunities to rural high schools until fiber-based full motion systems become available.
- Coordinate data services to rural public education sites using excess bandwidth on the compressed video network where it can be justified economically and makes sense to do so.

UEN Data Network provides data services and INTERNET connectivity to Higher Education, Libraries, and public schools in the state.

- ≅ Provide the state's INTERNET access through the University of Utah and WestNet.
- . Provide training and network applications to new and currently connected sites.
- ≅ Coordinate with state agencies to provide administrative services over existing UEN network facilities.

Governmental Services

The UtahNet provides T1 (1.544MB) frame relay connections to government entities throughout the state for access to ITS computers and LAN to LAN connectivity.

- . Continue support and implementation of the statewide frame relay network.
- . Continue the migration of SNA and X.25 networks to high speed frame relay connections.

ITS provides Transparent LAN Service(TLS) at 4MB, 10MB, or 16MB on a fiber based ring within US West's Salt Lake Main Exchange area.

- . Continue the support and training for the TLS network.
- . Expand utilization of TLS where economically feasible.

The Statewide Digital Microwave system provides T1 connectivity to major geographical centers throughout the State. It provides voice, video, data, and Public Safety communications in a cost effective and reliable method.

- . Utilize the existing bandwidth on the existing microwave network for point to point applications where available.
- . Provide additional compressed video channels in rural Utah.
- . Take advantage of the State's DACS technology to maximize bandwidth utilization.
- . Continue sharing mountain top repeater sites with educational entities, as well as other state, federal, and government agencies to minimize associated costs such as roads, access fees, construction, maintenance, and utility bills.

The Network Control Center located in the State Computer Center monitors the State's diverse network and provides remote diagnostic support, vendor dispatching, and remote management services. In addition, the Customer Service Center provides a single point for reporting voice, data, and network problems, as well as processing service orders.

- . Use the existing technology in the Network Control Center for supporting and managing today's networks while positioning it for new network technologies.
- . Position the Customer Service Center to assume additional support for new services while supporting the existing customer base and services.
- . Coordinate with educational and other governmental entities for comprehensive support and shared services to minimize duplication of resources.

The statewide voice network provides access to comprehensive voice applications by utilizing an effective mix of private and public resources such as Centrex, PBX, Key systems, leased lines, and digital microwave facilities.

- . Utilize existing facilities to minimize long distance charges by combining voice traffic on high speed lines.
- . Optimize vendor rates by increasing quantities on state contracts and negotiations for new services.
- . Continue support for applications such as voice mail, Auto Attendant, Interactive Voice Response, and Automated Call Directors.

Various entities within state government and educational services provide technical support and maintenance personnel.

- . The UEN provides engineering and technical support for the EDNET video services, INTERNET access, broadcast video services, and educational data applications.
- . Information Technology Services (ITS) provides planning, design, consulting, and implementation of voice, data, microwave, and radio communications.
- . UEN and ITS will corroborate on the design and implementation of any shared network facility.
- . ITS also employs voice, data, microwave, and radio technicians throughout the state capable of maintaining sophisticated hardware and software used in all applications for state government and its political subdivisions.

Provide New Resources

Pursue state of the art technologies to provide cost effective services as they become available.

- . Implement a statewide fiber optic backbone in partnership with a private vendor or vendors.
- ≅ Video, voice, and data services will be provided to sites as specified in the site selection and prioritization process.
- ≅ Implement an interactive multi channel video backbone (based upon fiber technology) statewide.
- . Provide services from the video backbone to higher education, public education, and government agencies.
- . Dial-in data services for education will be implemented at regional hub locations to facilitate data connections to homes for students, parents, and teachers.
- ≅ Strategic voice, video, and data hub locations will include: Higher Education, Regional Service Centers, Applied Technology Centers, Libraries, and Government Regional Centers, including cities and counties.
- . Sites unable to be served via the fiber backbone will be provided services through other technologies, such as T-1 based compressed video and frame relay.
- . Investigate connecting the fiber backbone through cable or phone providers for services to the homes.
- . Coordinate the use and sharing of network connections of all sites with other state agencies.

Vision

New technologies and applications will be investigated and incorporated to meet the changing needs of every site.

- ≅ Investigate and implement technologies such as ATM and SONET that will merge video, voice, and data services into one electronic highway.
- ≅ Investigate technologies enabling interactive video and data services to the home and/or private business.
- . Develop and implement a near on-demand video library service.
- ≅ Migrate all video services from scheduled services to on-demand services.
- ≅ Investigate the feasibility of distributing one-way high speed data services through broadcast television.
- ≅ Implement CD ROM library access through the use of the data and video services.
- ≅ Implement a single, shared, interactive network capable of isochronous point-to-point applications such as voice and video, as well as a meshed data network allowing access to all of the government and educational services throughout the state.
- . Develop a strategic plan to provide a wide area mobile radio and wireless data system.
- . Implement 24-hour access to government services through user-friendly KIOSK systems in public shopping centers and malls throughout the state.
- . Promote the development of CDPD technology with cellular companies for wireless high speed data connectivity over cellular networks.
- . Continue exploring the emergence of the PCS/PCN technology and determine the optimum way to utilize this new technology.
- . Provide a blueprint for establishing telecommuting standards including technologies such as ISDN primary and basic rate interfaces to promote the Governor's telecommuting policy.

Financial

All educational and government services will be provided to the state by utilizing existing and new technologies. Services provided by UtahNet will be based on the site selection criteria and funding resources.

- . Explore alternative funding sources such as federal grants and private/public partnerships.
- ≅ Evaluate agency budgets to determine duplicative funding and merge those into a single shared **UtahNet** budget.
- ≅ Create a five year strategic plan for implementation and funding.
- ≅ Determine where the potential for cost reductions in agency expense associated with the services offered on the Electronic Highway can be utilized for implementation (travel expense, personnel expense, etc.).

GEARING UP WITH TECHNOLOGY

A Centennial Challenge for Educators
By Gov. Mike Leavitt
July 14, 1993

One wintery day I prepared to fly home from Washington D.C. A winter storm had caused a normally 45 minute drive to the airport to be over 2 hours. Upon arriving, I rushed to the ticket counter only to find that my flight and every other one scheduled to leave the airport that afternoon had been cancelled. Still standing at the ticket counter, I set my baggage down to sort through my dilemma when to my shock I observed that the terminal was on fire. Flames emanating from an area 100 feet or so from where I stood shot all the way to the ceiling. I was stunned. Then I made a rather brilliant observation to the ticket agent. "Look at that," I said, "the building's on fire." The ticket agent glanced up from the ticket he was preparing and said matter-of-factly, "so it is."

As I prepared my remarks for today, I concluded that spending a lot of time describing the fact that we have flames of our own shooting into the air -- in the form of burgeoning enrollments, large class sizes and tight

funding -- might evoke a similar response from you -- "so it is". Those conditions have existed for years. Having to produce more and higher quality services with fewer resources than ideal, has become a fact of life in both the private and public sectors. So today, rather than focusing on our problems, I want to talk about solutions . . . and what I believe will be the most exciting and challenging era in modern education history. Exciting because solutions exist. Challenging, in that it will require change. Change in the way we think. Change in the way we work. Change in the way we measure our success.

My desire today is to discuss the innovative use of technological advancements -- harnessing and merging -- for the education of our young people -- the enormous capabilities of computers, telephones, television and satellites. And the world-changing result of merging their functions together. The ability to transmit and communicate interactively and instantaneously all sorts of information -- data, graphics, voice and video -- to almost any location.

Growing up, I delivered newspapers around Cedar City riding a big, heavy, red, one-speed Schwinn bike. It had a big frame, wide handlebars and a well-padded seat. It could haul a lot of newspapers, but the hills were murder. I had a route that included Leigh Hill. There are many homes there now, but then only a few. At almost the top was former Representative Haze Hunter's home. Each day I would pause at the bottom of the hill and then pump standing up as hard as I could to get my big red Schwinn to the top of that very steep hill. Each day I would slow to a stop and have to push my load of papers the rest of the way on foot.

At 5 o'clock every afternoon, all the paperboys in town would meet at what we called the "paper shack" to wait for the Wycoff truck to bring the papers from Salt Lake City. I remember the day clearly when I demonstrated for the other carriers my new three-speed bike -- we called them three-speed "racers " then. It had three gears that were changed with a thumb-shifter on the handlebar. Do you remember these? It allowed me to select a high, low or middle gear. By shifting into the lowest gear, if I peddled hard and fast, I could make it all the way to the top of Leigh Hill without stopping once.

Today, all-terrain 21-speed bikes are available. They are an engineering breakthrough . . . lightweight, yet strong, with amazing capabilities. One can shift to extremely low gears and climb steep, rocky hills with relative ease. On straightaways you can shift up to a high gear and burn up a lot of road with one turn of the pedals. The basics are the same. You must still balance, pedal and steer, but tremendous additional capacity has been produced through improved technology. The 21-speed bike offers a variety of options, depending on needs, desires, training, and capabilities. It has many gears, big ones and little ones, and they work together to make maximum progress. It is highly efficient.

Education as we knew it 10 to 15 years ago was much like the old one-speed Schwinn. It was serviceable and dependable, but it had just one speed. While some students pedaled faster than others, the system itself had not made a breakthrough into more gears and options.

However, progress is occurring. I commend our higher education institutions and our public education technology specialists who have worked hard to provide more gears, more speeds in our system. They have made notable and pioneering progress in the use of technology. Our EDNET system allows us to begin this effort with a remarkably strong base. We are expanding it rapidly. This year from 40 sites to 57 sites. The system has been limited because there has been only one channel and there is high demand to use it. So we're quadrupling the capacity from one to four channels. We are also making good progress in our use of Channel 9, the educational channel, and COMNET, a satellite network operated out of Utah State University. We are considered a national leader in distance education. Many of our education leaders in both public and higher education have caught the vision of where technology can take us.

Today, our system offers a limited amount of flexibility and choice, but not enough. You might say we are at the level of the three-speed "racer" bicycle. The system is on the cutting edge of today's technology and is serving thousands. Our challenge is to move to the 21-speed, all-terrain model by keeping pace with new technologies, and rather than thousands, we must serve hundreds of thousands.

To use the system today, a person must go to an EDNET site at a school or public building. As I mentioned, we are expanding from 40 to 57 sites. But, imagine the capacity of a system that is not limited to EdNet sites. A system that literally reaches every home, business and public building in the state -- for that matter, in the nation. From 57 EDNET sites to 500,000. And yes, we're expanding the number of channels. But imagine the unlimited capacity of a system with 500 channels.

This is not just a dream. It will soon be reality. As we speak, fiber optic systems are being planned and constructed by telephone and cable television companies. Within this decade, EDNET-type interaction will be possible over virtually unlimited channels from homes and buildings all over America. The potential impact on education is dramatic . . . no longer is the process restricted by place or space. Major universities in this country will be offering degrees to out-of-state students who never or at least rarely visit their campuses. It will become common for a student enrolled at Utah State to take a class from a professor from the University of Utah, or Southern Utah, . . . or Harvard or Stanford or Moscow or Bejing. Even a little more futuristic are the educational possibilities of holography, and virtual reality. Imagine a renowned professor delivering a lecture in your living room -- by holographic image. At some point in the future we won't have an education summit in Cedar City in July, we'll just stay home and project our image here. Then in the evening we'll enjoy entertainment by projecting the Shakespearean production into our living rooms. And for the fun of it, we'll change the face of Othello to Jerry Sherratt and Rob Bishop to Hamlet. His lines will be . . . "To open the caucus, or close the caucus . . . that is the question."

Other technologies support and hasten this trend. INTERNET is a world-wide computer network that our teachers, parents and students could use today -- right now -- if we provide relatively inexpensive modem hookups across the state. Much interaction between schools and homes could occur on the INTERNET and lessons and curriculum could be downloaded by anyone with a computer and modem. And by the end of our Centennial year it will be possible to transmit not just words and data over the INTERNET, but video and graphics. What does this mean? It means a student could use an ordinary computer with a telephone and extract at any time or any place a lecture, complete with graphics and video and interactive exercises. These are among the most sophisticated curriculum tools known, and are not being used in many of our classrooms.

Add to that CD ROM technology. Currently, CD ROM can be utilized in a properly equipped computer to provide video, text, sound and graphics, all integrated. This year, major electronics companies will begin marketing CD ROM players that are the size of a notebook. The cost will be under $1,000 and the price will drop rapidly.

This means that soon, very soon, the lectures and exercises we are providing students in our classrooms can be enhanced with video, sound, color and text, and delivered any time, any place, and as many times as necessary for the student to understand it. Will all of this replace the professors or instructors on our traditional campus model? No, but it will certainly change their roles and activities. It will mean they spend more time in laboratory settings, or informal gatherings of students, freed from the lecture hall.

Truly, this multi-geared education system will provide many choices and options. It will take what used to be classroom activities to the home, to the college dorm, to many public gathering places. It will move faster overall, but students will have enhanced ability to set their own pace. Students will still have to cover the distance, still have to balance, pedal and steer. They will still have to work hard.

But having the technology is not enough. We must be trained to use it properly. The first time I rode a 21-speed bicycle, I tended not to take advantage of all the gears. The enhanced capacity did me no good until I learned to use it. The same thing happens with new technology. Without training, teachers, students and parents will tend to stay in one or two gears, not using the tremendous capacities available.

1996 is our Centennial year, 100 years as a state. We have chosen to commemorate our Centennial by empowering public schools with the opportunity to restructure and re-invent themselves. We have accepted nearly 100 schools as Centennial schools so far and we hope to add many more in future years. Parents, teachers and principals are making remarkable progress in competency-based education and school-based governance.

It is now time to take another big step forward in both public education and higher education. Today I want to initiate that step by issuing three challenges that will take us to the next level in our pursuit of world-class education. When we hold this meeting three years hence, I hope we can celebrate our Centennial having made dramatic progress in technology delivered education.

THE CHALLENGES

FIRST, I CHALLENGE YOU TO MAKE EDUCATION AN ACTIVITY THAT IS NOT BOUND BY BUILDINGS, PLACE OR SPACE.

Let me elaborate. First, schools and campuses must facilitate, direct and enhance the learning process, but need not always be the location where learning takes place. We must get used to the idea of students learning at home, in dorms, at libraries, other community centers, and at work, not just in college or school classrooms. The learning experience must be extended to any location where a student can access teachers, lessons, tests, and other educational activities.

To do this, we must make a major shift, a historic shift, in our basic strategy. We must invest less in bricks and mortar, and more in technology. At the next legislative session I will announce a technology initiative. It will include components of training, and courseware development, as well as hardware and communications. It will bridge both higher and public education.

It will be a brave initiative because this transition will cost money. But much of the money will come from resources traditionally devoted in the budget to new bricks and mortar. We don't have the capacity to build the infrastructure of the future and still expand the infrastructure of the past at the same pace.

I propose that by the end of our Centennial year we make Utah an exemplary user of the INTERNET system. Our state will undertake the task of making INTERNET accessible to anyone with a computer and a modem. This is a major step in advancing the development of electronic highways throughout our state, providing remarkably enhanced communications among parents and teachers, and also providing access to thousands of data bases around the world. It will give every telephone the potential to provide access to the libraries and massive data bases of the world.

Next, Challenge #2: TO GO BEYOND DISTANCE LEARNING TO A NEW VISION -- A NEW LEVEL, MAKING TECHNOLOGY-DELIVERED EDUCATION A PART OF EVERY STUDENT'S EDUCATIONAL EXPERIENCE.

With distance learning we serve thousands. But this is a new vision. A system that serves not thousands, but hundreds of thousands. Not just the students whose unique circumstances create special needs, but a system that serves every student.

I challenge higher education to make available all courses necessary for general associate degrees through technology by the end of 1996. I also challenge you to expand the number of high-demand bachelor's degrees delivered through technology.

I'm not just talking about an expansion of television courses, but an expansion into every available medium. Entire courses should be obtainable on compact disk. For that matter -- entire majors could ultimately be placed on disk. The lectures could be filmed live, spiced with video clips, and enhanced with pop-up graphics. Students could be prompted and quizzed by interactive exercises throughout. None of this is new technology. What is new is its universal affordability.

Such courses could be offered with regularly-scheduled labs or discussion, or tests. Groups may meet once a week rather than 3 or 5 times a week. This multiplies the productivity of the instructor.

Should this type of education replace completely our current classroom method? Certainly not. But every student at every level should have a part of their education technologically delivered. Some institutions around the country require students to take one in five credits through technology delivered courses. In Maine, the number of student visits to campuses has been reduced 60 percent in 10 years. Why? Is it just because it's efficient? No. It's a critical part of the educational experience. Technology delivered education should join the three Rs and the college general education core as educational requirements.

We owe this to our students. Technology is changing the way we work, live and learn. Every Utah student should become familiar, not just with EDNET, but COMNET, self-paced computer courses, INTERNET, and other technologies already available, as well as the expanded options that will become available over the next few years. Not preparing students for the technology-delivered world is like not teaching them to read.

But let's not pass over the efficiency benefit. We face expanding pressures. There are economic transitions occurring every day in this global high-tech marketplace. Thousands of people are returning to higher education, seeking the retraining they need to stay in the workforce. This trend will accelerate. Some say we should just limit access. That's not the answer. We must provide some form of postsecondary training to every prepared student, and we will never be able to meet that obligation if we continue a bricks and mortar mentality. If one in five credit hours is delivered this way, not only will we have provided students with an essential educational experience, but we will make major strides in meeting this obligation.

I challenge the public education system to have the secondary core curriculum available for delivery through technology by the end of 1996. I envision the establishment of a Centennial High School, a school with no walls, no bricks or mortar. Centennial High will have no football team, no cheerleaders, no cafeteria. It will be an electronic high school. Students can enroll in it concurrently as they attend a regular high school. They can move in and out, according to their needs. High School credit will be available and a wide variety of classes will be offered. Students from Moab to Midvale, Magna to Manila, will be able to attend Centennial High. Just like in higher education, classes will consist entirely of video, graphics and data, available on compact disk or downloaded over networks, whichever best suits the student's needs. Many classes could include supplemental live discussions over EDNET or personal interaction with local faculty. Others will be completely self-contained.

An electronic Centennial High School can solve many of our remedial education problems in postsecondary education. If students don't have the preparation they need for college they can take technology-delivered high school classes to prepare themselves, complete with small group workshops to address individual needs. This moves us toward the seamless education system we need for the 21st century.

THIRD CHALLENGE: I CHALLENGE YOU TO PICK UP THE PACE IN EDUCATION.

Our system is defined too much by an institutional pace rather than the abilities or circumstances of individual students. For example, many young people waste their senior years in high school. We need to create incentives, financial and other, for high schools to move students though the system as quickly as the student has the capability to move. When a student has mastered high school curriculum, they should go on to college level courses or vocational training.

I propose the creation of a program to accelerate the education of those students who have mastered high school requirements before they would traditionally graduate. We will call it the Centennial Scholarship and Apprenticeship Program. Students qualify for the program by completing high school requirements early. Upon qualification, the state will award a $1,000 scholarship to any state-operated institution of higher education or applied technology center for which the student qualifies. The student may continue to participate in all high school extracurricular activities, including sports teams, band and orchestra, and social events. If the student desires apprenticeship training, the $1,000 can be allocated as a grant to a potential employer upon successful completion of the apprenticeship.

We must also provide adequate incentives for the school. They will be permitted to keep the balance of the WPU, a little over $500, despite the fact that services are no longer being provided to the student.

Centennial High School, with its widespread availability of technology-delivered education, will help make the scholarship program successful because motivated students will have increased access to classes that will accelerate their education.

Utah has a nationally-acclaimed advanced placement program, and we are also doing well in concurrent enrollment. But we can double and triple concurrent enrollment through technology delivered education, providing motivated high school students with countless college options while they are still completing high school.

Colleges and universities, you must eliminate the roadblocks to timely graduation. We need to provide students a means to get their degrees in four years. Many students could earn bachelor's degrees in three years instead of five plus. The major roadblocks to this now are bricks and mortar, place and space, all of which can be eliminated as barriers by offering technology-delivered education. We can make our system more productive, efficient and seamless with technology. Having classes available electronically at times that meet student needs can help prevent much of the delay and gridlock that now occurs.

There are other barriers. While much progress is being made in easing transfers among Utah colleges and universities, improvements are still necessary. The bottom line is, there are a hundred reasons why it takes so long for a student to work through the system. I call upon you to remedy those that are caused by the system. A student needs to be able to get a four-year degree in four years.

CONCLUSION

In conclusion, I recognize that these are difficult challenges. I also recognize that there will be cynics and naysayers. Some will dismiss this emphasis on technology as a passing fad. I assure you that it is not. It is the future. Whether we accept these challenges or not, all of these things will happen one day. The only real question is whether we lead or follow. If we follow, other states, private schools, and even other countries will have an advantage over us. Some traditionalists may see this as simply a way for the governor to avoid focusing on things they view as more pressing, such as higher salaries and more classrooms. I see this as the best way to address those needs. Critics will point out that most teachers, students and parents are undertrained and ill-prepared for technology-delivered education. They are right, but that can and will be changed. Some will argue that lower income and disadvantaged families will be left out. In reality, it is the disadvantaged students that can benefit most from this initiative. Some will say that this abandons the great traditions of the Socratic method. I contend that in many cases we traded in the Socratic method years ago for large impersonal lecture halls. Technology-delivered education brings Socrates back over EDNET, COMNET, INTERNET. The spirit of Socrates will be everywhere, teaching our citizens the critical thinking skills that prepare them for tomorrow.

This is the opportunity of a generation. It is the big gear, the 21-speed, all-terrain version. Technology will never replace great teachers. But it will be a powerful tool in teachers' hands, helping them facilitate and coach, not just lecture.

Utah is enormously well positioned to take advantage of the technological revolution that is occurring. We have a critical mass of world-leading high-tech companies that are willing to help us. Even today, we will make an exciting announcement about WordPerfect coming forward with a great new program to provide computer software training to our teachers and students statewide. We have a well-educated citizenry attuned to the potential of the telecommunications revolution. We have a great advantage in the expertise that already exists in public education, higher education, state government and the private sector. Our major institutions like the University of Utah and Utah State University are providing significant leadership in electronic education. We can make it happen here faster and better than anywhere in the country. We can take our education system from the old factory, assembly-line, one-size-fits-all model, to a decentralized, competency-based system with freedom, flexibility and high efficiency.

We have in this room the people and the power to make these things happen. We are here today as a team. I am only one part of the team. A governor in Utah does not directly control or govern education. I have at my disposal three tools. I have the power to recommend education budgets to the Legislature. I have the power to make appointments to education-governing boards. And I have the power of the pulpit, which I am using today. I will not hesitate to use the others as well.

Together, we will move forward, as a team, in bringing Utah a fast-paced, seamless education system. Thank you.

ELECTRONIC HIGHWAY SUMMIT SPEECH

Monday, Nov. 8, 1993
By Gov. Mike Leavitt

In my inaugural address 10 months ago, I pledged to lead this state to a whole new level of performance. We have a great opportunity to achieve a new level of performance in the area of information technology. Today, I am calling on all of you, as state leaders and information technology managers, to help in this effort.

In that inaugural address, I told a story about driving from Cedar City to Salt Lake City in the 1950s. It was a much longer adventure than it is today. I used to marvel at the vision of the leaders of that day who saw the need and established a national goal to build an interstate freeway system before traffic became a crisis. It was controversial, but some could feel the excitement of such a daring undertaking. People in the towns throughout rural Utah were concerned about being bypassed by the freeway. And patterns did change. Some areas were left out; others emerged stronger, taking advantage of the increased traffic and inherent flow of dollars.

I described how in this era a new and different type highway must be built. This electronic highway will be critical for the high-paying, high-tech enterprises of the future. And this highway must not bypass any parts of Utah. To be bypassed would mean real isolation and economic hardship.

We have spent several months now investigating and monitoring the development of the electronic highway in Utah. We have held many meetings, made contacts with numerous committees and task forces, and checked progress in other states. We feel we now have a direction and vision with which to proceed. We want to move forward quickly and provide access to the electronic highways and services to our citizens.

Before discussing specific challenges with you, let me share my view of the electronic world with you.

I believe we are entering an exciting new era in society . . . our world is becoming an information ecosystem, and the ramifications are monumental. Futurists believe there will be a massive shift in the nature of work, that the impact of the information age may be as great as the societal changes that occurred during the industrial revolution.

The thoughtful and informed management of these exciting opportunities for increased productivity, improved government services, a new arena of business and entrepreneurial opportunity, and an enhanced quality of life may be the most important item on the public policy agenda for our state and nation in the next generation.

Computer technology has been around for many years. But only in the last few years have a variety of elements converged to drive this transformation. Only now is the digital revolution fulfilling its promise. We should remember that it took some 40 years after the discovery of the light bulb for electricity to effect major changes in society and to dramatically improve productivity. It took that long for power sources to be developed, for lines to be strung, for electrical appliances to be invented, for a regulatory structure to be constructed, for industrial steam engines to be converted, and for the general public to accept this technology and put it to good use. Now, there is little that we do that does not involve electricity. It has transformed society, but we take it for granted.

Today, we stand at the point where digital technology is about to sweep society with the same impact that electricity has had. It has taken a number of years to develop the critical mass of computer hardware, software, networking and public acceptance for this to happen. We are now seeing tremendous productivity surges in the private sector. There's a PC on nearly every desk in the workplace and computer technology is involved in most pieces of sophisticated equipment. What was once an obscure science practiced mostly by what we called computer techies, is now being embraced by nearly everyone. It is the most exciting area of business, and of government, with enormous promise.

We are now seeing the merging of several industries -- television, telephone, cable, entertainment, satellite, wireless, and computers -- into one vast network with many components and parts, and applications and partnerships, but that is all seamless. And this information highway will feature full-motion video, audio, data, image, voice, text, color, and so forth. Eventually, the technologies of virtual reality and holography will become part of it. Imagine the time when, instead of simply talking over the telephone line, we are able to create three-dimensional images of ourselves and project them into physical space, allowing people situated in different locations to virtually meet with each other. What's more, as these industries are merging, they are becoming far more powerful, with tremendous amounts, more capacity, much faster, much more compact -- and at the same time far less expensive. A veritable tidal wave of technology is sweeping over us.

The day is coming -- and soon -- when all Utahns will be able to access information and communicate with each other easily, reliably, securely and cost-effectively in any medium -- voice, data, image, or video -- anytime, anywhere.

As state leaders, this is the future we must plan for -- not using technology of today, but looking toward the technology of tomorrow.

A few months ago, I issued some specific challenges to the education community to accomplish before the end of our Centennial year in 1996. I asked them to make education an activity not bound by buildings, place or space. I asked them to make technology-delivered education part of every student's educational experience. I am pleased with some of the initial response. Today, I first want to focus on state government. I want to issue some general challenges to leaders and employees in state government, and then I want to talk in more specifics.

1. First, I challenge all of us to change the way we think. Operating in the information ecosystem will require a new mindset. We must be willing to change, to restructure and re-invent. I submit that a whole world of possibilities is opened when two people -- or many more -- can sit at separate locations and look at and work on the same documents, see each other, transmit large amounts of information back and forth, and quickly access other people's information and other data bases. The ramifications for citizens services, for business services, for telecommuting, for reducing highway congestion, for reducing pollution, and so forth, are enormous. But we must begin thinking technology, thinking new applications and ways of doing things, if we are to make this vision a reality.

2. Second, I challenge employees and department and division leaders to focus more on technology and less on bricks and mortar. Technology is enormously expensive. We must make these breakthroughs and enter this new world by using existing financial resources. We must find money through reallocation, not through higher taxes. We must find ways to use our resources better.

3. Third, I challenge you to think specifically of ways we can deploy technology to increase our productivity and provide easier access to state information and services to citizens. We must put the state of Utah at citizens' fingertips. Most of the best ideas won't come from the governor or from your department or division director. The ideas will come from the bottom up, from you and your employees who are on the front lines delivering services. What services can be delivered electronically? How can we provide electronic interaction between citizens and government? Can we develop a system whereby a citizen with a computer, a modem, and perhaps a smart card, can register and incorporate a business, renew a driver license, purchase a fishing license, pay taxes and fees, and so forth? I challenge you to review the services your agency provides, the interaction you have with citizens, and determine how you can make those services available electronically.

4. Fourth, I challenge you to make available electronically the enormous amounts of information state government collects. Obviously, we must not violate anyone's privacy and we must maintain security. Decisions about the availability of data will have to be made on a case-by-case basis. But there exists within state government tremendous amounts of information that should be available to citizens. Within my own office and my Office of Planning and Budget we have databases on boards and commissions, registered lobbyists, political contributions, and valuable economic, demographic and budget information. We produce many press releases, position papers and speeches. All of these things should be available to citizens. Other agencies have data that is valuable to citizens and businesses, things like the Utah Code, state administrative rules, daily status of bills in the Legislature, attorney general opinions, court rulings, public event calendars, job listings, consumer information, business listings, state and federal procurement opportunities, training courses, weather information, licensed day-care providers, and much more. This information must be accessible electronically to the public. Presently, much of it is hard and inconvenient to obtain. We can do better.

5. Fifth, I challenge you to encourage a strong competitive environment among the private communications companies that are providing the basic infrastructure for the information highway. The communications infrastructure throughout the United States and Utah is quickly being enhanced with fiber optics cable. U.S. West and smaller common carriers are in the process of upgrading their systems. In addition, companies like TCI, Electronic Lightwave and Wiltel are building fiber optics systems or upgrading existing infrastructure. A competitive environment will allow us to move ahead more quickly with the applications we need in state government. Capacity will be increased and costs will be reduced for both government and the private sector.

Now, all of these things will require a great deal of coordination and collaboration. One of the most important messages I want to leave today is that we must avoid parallel networks and duplication. We must be as efficient and effective as possible. We must work with other education and government entities. We must avoid turf battles and infighting. We must look at the citizen as a customer of the whole state, not the customer of just one state agency. We could easily fall into the trap of building numerous electronic highways, one overlaying the other. A typical high school, for example, could have many onramps supporting multiple highways for instructional video, instructional computing, administrative computing and job placement services. We must strive for the construction of a single highway that will support a maximum number of applications. Tax dollars must be stretched at every level of government and education. I challenge you to work together in a cooperative spirit, avoiding redundant costs and efforts.

To coordinate this effort, I have created an Electronic Highway Task Force, chaired by Ladd Christensen from the private sector with Gordon Peterson, the state's Information Technology Coordinator, as executive director. The Task Force, in turn, has created a number of committees and subcommittees, and is coordinating with other committees and task forces that already exist. I am asking that you work through this structure, which includes representation from all agencies, to move our state into this exciting new world. Let me stress the importance of coordinating with our Division of Information Technology Services, the implementation and services arm of this large effort. We have skilled and visionary people in that division who will be invaluable as you move forward.

Among the key groups who will guide our progress are the Information Technology Policy and Strategy Committee, which consists mostly of department directors, the State of Utah IT Managers, and other IT Steering Committees throughout state government.

Some of these committees in the past were fairly obscure and operated behind the scenes. Today, they are among the most important groups working in state government and they will be key to our success.

Let me issue some specific challenges. We have formed two committees to focus on business services and citizens services. I challenge them to develop, within a year, as full a range of electronic services and information databases as possible.

We must create a state information and services network that is of real value to the business community and citizens. The network should be open and accessible to everyone.

Other challenges:

Telecommuting: Many private companies are improving productivity and reducing building construction and maintenance costs by asking employees to work at home, connected on-line to the office. Besides reduced building costs, we reduce freeway congestion and pollution by encouraging telecommuting. I challenge state managers to have as many of our state workers as possible telecommuting by the end of our Centennial year.

Video conferencing: This is closely related to telecommuting. By the end of 1996, I challenge state agencies to cut travel by 15 percent. We need to hold meetings electronically. Avoiding travel will reduce state expenses and traffic congestion. Video conferencing will allow electronic town meetings, statewide public hearings without travel, and video arraignments, eliminating prisoner travel costs and improving security. We must work together with higher education, school districts, local governments and even the private sector to create a unified system that will serve everyone, benefitting citizens by minimizing redundant systems and reducing overall costs. Within a few years, video conferencing is expected to be as widespread as the use of the fax machine is today.

Wireless technologies: Wireless communications will be used to connect and enhance the electronic highway. Wireless communications will provide us with the means to interact with one another without being tethered to the office. Phones, computers, fax machines, radios, electronic tablets, pagers and E-Mail terminals are among the many wireless devices presently available. The advantage of these devices is the portability they bring to the work place. Employees can reach the office any time and the office can reach the employee any time. Numerous wireless communications products and services are being developed and are expected to become less expensive over time. Because of the importance of wireless communications, I have impaneled a task force that will recommend how the state can maximize the use of this expanding technology. The task force will study the type of system we need, what benefits it will provide, how we will fund it, how it will grow and how we will include all levels of government.

The possibilities are endless, including intelligent vehicles and intelligent highways. This technology has many ramifications for law enforcement, allowing agencies to transmit mug shots to patrol cars, silent dispatch, and allowing officers in the field to instantly access law enforcement databases to check for stolen cars, expired registrations and criminal wanted lists.

INTERNET: I challenge you to explore the possibilities of making the INTERNET available to every citizen. It is a technology that exists today that could provide every citizen with electronic mail and a means for parents to communicate with schools. It could also be the means to access state databases.

ATM: I challenge you to develop a strategic plan to bring ATM capabilities to the state. ATM, with its large capacities for interactive video and other applications, is very expensive. But we must determine how we can bring this technology to our agencies and citizens.

WAN: I challenge you to continue to develop the state's Wide Area Network, expanding its capacity as technology allows. Our employees need to make better use of E-Mail, electronic calendaring, task management and work flow management.

Paperless Offices: With more electronic interaction, we can reduce our paper costs. Paperless offices really are possible with new software and data management systems.

Over the last several months, we have spent a great deal of time talking and investigating. Now is the time for action. I hope each of you will commit to helping us take state government into the information era. I don't believe the barrier here is technology. I believe it is lack of vision and unwillingness to change and try something new. Thank you for your support.

The following is a copy of the Memorandum of Agreement between the Division of Information Technology Services and the Utah Education Network:

January 26, 1994

Leon Miller
Director Division of Information Technology Services
6000 State Office Building
Salt Lake City, Utah 84114

Dear Leon,

As we have discussed, these are the basic areas of agreement between the Division of Information Technology Services (ITS) and the Utah Education Network (UEN) as we work in harmony to develop a wide area data network and a portion of the video network for public education.

ITS will provide the following:

1. Competitively priced transport service for data with the possible expansion for video in the future.
2 Network monitoring of the wide area data network.
3. A network help desk.
4. Installation and maintenance of the wide area data network.
5. Some budget for development of the wide area data network.
6. Administrative services.

UEN will provide the following:

1. The primary contact with the schools for access to INTERNET and the data services provided by UEN's Utah Link.
2. Prioritize the public education sites to be linked with the network.
3. Determine network use policy for education.
4. Provide coordination of program services to schools.
5. Provide inservice training.
6. Pay for ITS's services on behalf of Public and Higher Education.
7. Possible scheduling for state video networks.

Technical planning, standards and pricing of services are critical and something we will work on together. The schools will hold our feet to the fire on costs. The Technical Plan, upon which our staffs have been jointly working, is an excellent example of how we can cooperate to solve the problems that we all face.

These areas of agreement need further details spelled out. But, I thought it would be good to get some basic areas of agreement in writing to guide our people in working together and stop duplication of effort. If you have any questions or concerns, please let me know.

As you are aware, there are several other areas of concern that need further discussion. We are preparing a proposal that will address those concerns with the intent that we can jointly formulate a working agreement that will permit us to work together and meet the needs of all of the entities that have interest and concern regarding how the "electronic highway" will impact and serve them.

Sincerely,

Stephen H. Hess
Director

c: Jeff Livingston, Chair
UEN Steering Committee
Jerry Peterson
Laurie Chivers
Scott Bean
C.C. Foxley

CC: GVDOMAIN.GVSMTP(SHESS)

GLOSSARY OF TERMS

Automated Call Distribution/Call Management System: Systems designed to distribute incoming call traffic among agents, clerks, or attendants; and to provide statistical management reports on call volume, usage, etc.

Automatic Call Distributer (ACD): A PBX-based feature that automatically routes incoming calls and allows users to track usage, completed calls, abandoned calls, etc.

Agency Bulletin Board System or Contracted Services: Agency information may be uploaded to a bulletin board system owned by the agency or offered through contracted services, such as America Online, for access by the agency's customers. Information might include policies, procedures, minutes, notices, agendas, tax information, employment opportunities, environmental information, road conditions, etc.

Agency Help Desk: A centralized location within an agency and/or department where employees can obtain help on computer-related problems or questions. Help desks can store information about problems from initial reporting through problem resolution. This information can be accessed, analyzed, and summarized to use in future problem resolution and/or prevention.

Agency Information on an INTERNET Gopher Server: Agency information may be provided on an INTERNET Gopher server, making it available for world-wide access. For example, the Governor's Office provides the Governor's speeches, information technology and electronic highways information on the University of Utah (U of U) Gopher Server. In addition, the U of U provides phone books, calendars, on-line catalogs, reference books, computer and library information, news services, job listings, on- and off-campus information, research, health workshops, clinical alerts, etc.

Agency Information on the State Bulletin Board System: The State of Utah Public Access Bulletin Board System (BBS) owned and operated by the Division of Information Technology Services may be used by agencies to make information available for download to their customers. Access the BBS by either using a modem and dialing (801) 538-3383, or using UtahNet, the state's wide area network (see your agency LAN administrator for details). Examples of information which is already available from several state agencies include policies, procedures, minutes, notices, agendas, tax information, employment opportunities, environmental information, etc.

Agency Labor Cost: The estimated cost of labor to complete, conclude, or bring a project into full production. This cost estimate should include the estimated cost of the direct labor hours, plus a labor additive of 35% to cover benefits cost. The labor costs should include all costs associated with the decision to implement the project, including estimated costs to rewrite computer program interfaces to other affected systems, training costs of users, etc.

Agency Labor Hours: The estimated number of person hours to complete, conclude, or bring a project into full production. This labor hour estimate should only include the estimated direct labor hours. The labor hour estimate should include all hours associated with the decision to implement the project, including estimated labor hours to rewrite computer program interfaces to other affected systems, training hours for system users, etc.

Agency Systems Development Methodology: A systems development methodology is used to control the design and development of a computerized information system. It includes a set of mutually supportive and integrated guidelines organized into a series of chronological phases that make up the cycles of a computer system. Phases generally include: initial investigation, feasibility study, requirements definition, external design, internal design, programming, testing, conversion, and implementation. Each phase will have many detailed tasks to complete the phase. The systems development methodology paints a complete picture of the project plan phases from the initial investigation of the potential need for a new computer system through implementation into production. Examples of systems development methodologies presently used at the state are:

- AMS's Life-Cycle Productivity System (LPS) Package System Implementation (PSI) used for the FIRSTplus project.
- IBM's 3309 Systems Development Methodology used on the ORSIS project.

Automated Call Distribution/Call Management System: Systems designed to distribute incoming call traffic among agents, clerks, or attendants; and to provide statistical management reports on call volume, usage, etc.

Automated Information Exchange with Partners: Electronic exchange of information between an agency and its business partners, such as other agencies; federal and local governments; and the business sector. This might include statistics, demographics, census data, and environmental, health, traffic, road, business, financial, legal, safety, and other related information. Business partners include entities such as WordPerfect, Novell, Folio, US West, Mt. Fuel, etc.

Automated Project Management: Describe the project management software to be used for the project. For example, Microsoft Project, Project Workbench for Windows, etc. Automated project management software allows project managers to detail task descriptions, the estimated hours by task, and match available project personnel resources to those tasks. Key estimated task completion dates are calculated. Actual task completion dates are entered. The software usually produces Gantt charts, reports, resource utilization reports, etc.

Automated Attendant A PBX based feature that allows incoming callers to select where the call is routed without operator intervention. (example press 1 for problems, 2 to order, 3 for operator, etc.).

Asynchronous Transfer Mode (ATM): A broadband packet switched technology allowing highly efficient data transfer across the network at potential speeds exceeding 1 gigabit per second.

Benefits: Describe the positive results gained by completing the project. Benefits are the positive results gained by completing or bringing the project into full production. Some examples include:

- Increased speed, effectiveness, and productivity
  Improved communication
  Meets customer needs
  Improved access to information and services
  Reduced paper chase, mailing costs, and lines at the fax machine
  Added capacity and performance required for increased use
  Enabled telecommuting and access for workers
  Enabled timely and accurate reporting
  Enabled more efficient sharing and exchange of information
  Reduced file search time
  Enhanced tracking of information
  Enabled efficient storage and retrieval of information
  Enabled more accurate and faster downloading of information
  Improved accuracy of data collected
  Protected sensitive information
  Reduced workers' phone time
  Improved employee skills
  Improved employee satisfaction
  Improved customer satisfaction
  Secured the environment
  Increased knowledge
  Improved management

Better Government: Better Government is one of Governor Leavitt's five key objectives. Some examples of projects which might support this objective include:

- Deliver government benefits electronically
- Improve efficiency and productivity of state government
- Provide and improve electronic services to businesses and citizens
- Allow business sector and citizens to interact with state government more efficiently and easier
- Promote telecommuting
- Provide nonstate entities access to UtahNet and the BBS
- Cooperate with outside entities
- Cut costs
- Allow "carryover" of existing funds
- Make renewal of licenses easier, less "red tape"
- Eliminate duplication
- Automate time sheets
- Revise Purchasing procedures
- Make it easier to obtain government services from home or remote locations

Business Process Re-engineering: Business process Re-engineering is the act of examining programs and processes and making them more efficient and effective, using new ways to carry out traditional duties. Entrepreneurial agencies forget how they are organized, decide what they need to do, and design the best structure to do it. They abandon the obsolete, eliminate duplication, and embrace advanced technologies to cut costs. Vice President Al Gore, in his book Creating a Government that Works Better and Costs Less, suggests four key principles to guide Re-engineering efforts:

- Cut Red Tape
- Put Customers First
- Empower Employees to Get Results
- Cut Back to Basics: Produce Better Government for Less
- David Osborne and Ted Gaebler, in their book Reinventing Government, offer additional guiding principles for entrepreneurial agencies to consider.

CASE Tools: Computer aided software engineering (CASE) tools help organize, structure, and simplify the software development process. Improving software development productivity and enhancing the quality of the resulting software are the expected benefits. Desirable features of a CASE tool include:

- Support the documentation of the requirements definition process.
- Provide data flow diagrams.
- Integrate logical data structures into the process.
- Provide an effective normalization process.
- Enable a smooth transition from logical to physical database structure.
- Easily develop top-level application logic flow and testing.
- Translate program specifications into skeletal program source.
- Provide overall documentation reports.

CD-ROM (Compact Disk - Read Only Memory): Compact disk technology capable of storing up to 660 Megabytes of data on a single disk that can be accessed at extremely fast speeds.

CDPD (Cellular Digital Packet Data): A new open standard of transmitting data across the cellular network in a packet format.

Centrex: A Central office-based telephone service offered by Local Common Carriers allowing features such as call waiting, conference calls, etc.

Classification, Ownership, and Custodial Responsibilities: Classification involves establishing a system of priority for protecting an organization's resources. Classifications under the Government Records Access and Management Act include: public, private, controlled, protected, or limited. Ownership involves identifying who will be responsible for access to the information commensurate to the function being performed. A custodian is the individual or agency authorized to have possession of the information by the owner. Custodial responsibilities include following controls specified by the owner.

Client/Server Database Management Systems: Client/Server computing is a processing model in which a single application is partitioned between multiple processors (front-end and back-end) and the processors cooperate transparently to the end user to complete the processing as a single unified task. Client/Server database management systems use built-in intelligence to extract only the specific data requested, so traffic and overhead are reduced and the network maintains high performance. Additionally, security and data integrity are maintained centrally on the server--an important benefit in a multiuser environment.

CMS (Call Management System): AT&T's adjunct system on PBX systems that provides incoming call records and management reports.

Compressed Video: Technology allowing video signals to be compressed onto T1 (1.544 Megabits per second) or lower with some degradation of signal quality.

DACS (Digital Access Cross-Connect System): Circuit switching technology allowing individual DS0's (56 kilobit channels) to be switched between multiple T1 (1.544 Megabit) high speed circuits.

Decision Support Software: Decision support software allows direct access to mission critical data, whether the data is maintained on a mainframe, minicomputer, or local area network server. The decision support software allows easy direct exchange of data to LAN or PC based spreadsheets, databases, word processing software, or report generation software. An example is direct transfer of data normally maintained on the mainframe computer to the employee's workstation spreadsheet, a transfer made possible by the decision support software.

Document Management (i.e. Soft Solutions): Document management systems focus on the electronic tracking, storing, retrieving, and managing the flow of documents, including version control, viewing/previewing, indexing, archiving, and accounting/billing. Most document management systems are designed to work closely with one or more word processing programs.

Contrasted with electronic imaging, document management systems focus on the management of revisable computer files that happen to be printable. Electronic imaging focuses on the management of scanned images of paper documents. Scanned images tend to flow from workstation to workstation for perusal, some kind of action, and finally archiving, much as the paper documents they replace would flow in a manual system. In contrast, revisable files tend to be located, edited, printed, and very often purged.

Documented Contingency Plan: Contingency planning includes such practices as knowing which systems are critical, knowing who to contact when system failures occur, knowing how much downtime will be tolerated before dramatic steps must be taken, backing up and storing information off-site, falling back on alternative manual procedures when critical processing cannot be done, etc. Documenting contingency planning practices formalizes these practices, and provides a basis for communicating them to employees. Of course, the documented contingency plan should be tested periodically to determine whether it will work in a disaster.

Documented Security Plan: Security planning includes such practices as ensuring the integrity of information; protecting the privacy of proprietary, personal, privileged, or otherwise sensitive information; protecting information technology resources from the hazards of fire, water, earthquake, theft, misuse, vandalism, etc. Documenting a security plan formalizes these security practices, and provides a basis for communicating security practices to employees.

800 Service: A service provided by the major telephone vendors which allows the purchaser of the service to pay for any long distance charges from in-coming callers. Service is generally provided as a convenience to long-distance customers.

EDNET: A statewide microwave and compressed video network provided by the University of Utah providing two-way interactive services between Higher Education, Applied Technology Centers, and High Schools.

Electronic Benefits/Payments Transfer: This technology involves the electronic transfer of assets or benefits to business partners and/or clients, in the form of:

- **Automated Clearing House (ACH) Payments:** Periodic, recurring transactions that generally do not require additional manual intervention once established. Examples are automatic payroll deposits, automatic collection of monthly payments (such as insurance premiums), or automated cash concentration systems.
- **Electronic Benefits Transfer (EBT):** Electronic transactions involving the transfer of benefits, such as food stamps, aid to families with dependent children, and general assistance. Clients are provided electronic cards (magnetic stripe or smart) for use at point-of-sale terminals to receive benefits.

- **Electronic Data Interchange (EDI):** Electronic exchange of purchase order data, receiving reports, invoices, and vendor payments.

- **Electronic Funds Transfer (EFT):** Nonrecurring electronic transfers that require more extensive manual intervention to occur, such as wiring funds to someone in another city.

Electronic Forms (i.e. WP InForms): An organization can design and create electronic forms to replace paper forms using electronic forms processing packages, such as WordPerfect InForms. Electronic forms can be distributed and routed using WordPerfect Office and other electronic mail packages. Those who design the electronic forms can make them easier for someone to fill in, by adding "Object Help" fields which are accessible on demand. Fields within forms can be formatted as text, radio buttons, check boxes, numeric, or calculated, offering the designer a great deal of flexibility in how the form is to be filled in. The designer can also add security, via electronic signature, for those forms that need to have data visible and accessible to only select individuals. When forms have been filled in, the data can be accessed, analyzed, and summarized in a variety of ways using new and existing databases.

Electronic Text Indexing/Retrieval (i.e. Folio): An organization can create, distribute, cut and paste information from, and search through large, formatted documents using electronic text indexing and retrieval software, such as Folio Views. Textbase programs provide tools for text creation, formatting, linking, and otherwise manipulating records. These editing tools make textbase applications well suited not only for straightforward text retrieval but also for the creation of documents that are meant to be read and explored on-line rather than on paper. Electronic documents can take advantage of hypertext links, pop-up graphics, attached notes, and sound and video clips to make information more engaging and easier to use for readers. Documents which lend themselves to textbase systems include technical manuals, works of literature, or large electronic documents.

Expected Benefits: Benefits are the positive results expected to be gained by completing or bringing the project into full production. Some examples include:

Increase speed, effectiveness, and productivity
Improve communication
Meet customer needs
Improve access to information and services
Reduce paper chase, mailing costs, and lines at the fax machine
Added capacity and performance required for increased use
Enable telecommuting and access for workers
Enable timely and accurate reporting
Enable more efficient sharing and exchange of information
Reduce file search time
Enhance tracking of information
Enable efficient storage and retrieval of information
Enable more accurate and faster downloading of information
Improve accuracy of data collected
Protect sensitive information
Reduce workers' phone time
Improve employee skills
Improve employee satisfaction
Improve customer satisfaction
Secure the environment
Increase knowledge
Improve management

FCC (The Federal Communications Commission): A federal regulatory body for communication networks and Common Carriers.

Frame Relay: A switched packet technology that provides meshed data networks capable of operating at speeds up to T1 (1.544 Megabits per second).

Full Motion Video: Broadcast quality transmission of video signals where images are transmitted in real time and motion is continuous. This technology requires a full 6 Megahertz of bandwidth on analog technology and up to 135 Megabits per second on digital technology.

Geographic Information Systems: A geographic information system (GIS) is a tool for linking and integrating information and presenting it visually in a map. It provides a means to inventory and/or catalogue digital geographic data from federal, state, and/or local sources. Data is separated by function, standard, format, subject, layer, and integration. GIS improves, for example, work flow, planning, resource management, demographic analysis, facilities management, economic analysis, environmental protection, redistricting, mapping, soil conservation, etc. The Automated Geographic Reference Center (AGRC) within the Department of Administrative Services developed a State Geographic Information Database (SGID) to provide GIS services to all state agencies. GIS applications in the Governor's Office of Planning and Budget are for "tiger" files released by the Census Bureau, and summary tape files. Other departments, such as Natural Resources, Transportation, Environmental Quality, Health, and Agriculture, use GIS for their various needs. More information on GIS can be obtained by contacting Dennis Goreham, Director of AGRC, at 538-3163.

Global Positioning Systems: The global positioning system (GPS) is a system of 24 satellites that are currently maintained and operated by the Department of Defense that allows one, with a receiver, to determine his/her position on the surface of the earth (latitude, longitude and elevation). The GPS may be used for surveying and aerial photography to pinpoint and locate objects very accurately (within five meters). More information on GPS can be obtained by contacting David Vaughn, Automated Geographic Reference Center, at 538-3165.

Imaging Systems: An imaging system is a computer based system that converts digital pictures of documents, people, or other things into digitally stored files. This allows computerized capture, storage, retrieval, display, processing, manipulation, and distribution of digital representations of documents, people, or other things. An imaging system typically consists of a storage medium; image server; imaged document printer; scan station monitor, LAN connections, scanners, software drivers, and video cards; a UPS; view station monitors, CPUs, and video cards; optical jukeboxes; scan station auto document feeders, CPUs, storage devices, and scanners; image management software; indexing and storage software; work flow management software; and imaging software development tools.

Interactive Voice Processing: A computerized telecommunications system which facilitates the retrieval of specific information from, or the conducting of online business transactions with the host computer data base and delivers it to a caller in the form of a voice response (usually based on the caller's entry of a Personal Identification Number). An example is an ACCESS system used by financial institutions (credit unions, banks, etc.)

INTERNET Connectivity: INTERNET is a packet switched network of about 10,000 interconnected networks which now dominates networking throughout the world. INTERNET is a network of about two million servers and about 20 to 30 Million nodes. The State of Utah connects to INTERNET through ITS and the University of Utah. Interconnection is via TCP/IP. INTERNET is principally used for sending electronic messages, and viewing and downloading of information.

A state agency is considered connected to INTERNET if one or more of state agency work stations can use one or more of the following INTERNET services: Mosaic, Cello, Gopher, Archie, FTP, Telnet, Usenet, Veronica, WAIS, or World Wide Web.

ISDN (Integrated Switched Digital Network): A standard allowing voice and data to be transmitted over existing copper facilities in a digital format. Basic Rate Interface (BRI) allows one 64 kilobit voice channel, one 64 kilobit data channel, and a 16 kilobit signalling channel to be combined on a single pair of copper wires. Primary Rate Interface (PRI) allows in band signalling in a standard T1 format providing 23 64 kilobit channels on a two pairs of copper wires with a multitude of feature capability in the 24th channel.

ITFS (Instructional Television Fixed Services): A University of Utah system providing one-way distribution of instructional video and audio programming to the medical community in Salt Lake Valley.

ITS (The Division of Information Technology Services): Provides voice, video, and data services to government and educational facilities throughout the State of Utah.

IVR (Interactive Voice Response): Provides a link between callers and computer databases that allows users to input responses via the keypad on their phone or by voice. These systems have the capability of recognizing voice responses and converting them to a text format, or converting text to synthesized voice responses.

Key System: Small telephone switching systems allowing users to share telephone lines and provides features such a call hold, forward, conferencing, etc.

KIOSK: Remote systems similar to banking Automated Teller Machines (ATM). These devices will allow users to access government services and make payments utilizing a credit card and will be located at remote locations such as shopping centers and malls.

KUED: The Public Broadcasting System television station operated by the University of Utah.

KULC: A television station operated by the University of Utah providing K-12 instructional programming Monday through Friday in support of the Utah State Office of Education and college credit telecourses evenings and weekends sponsored by the state's universities and colleges.

LAN (Local Area Network): The technology used to link multiple computers together into a single, shared network, typically within a building or campus environment. These systems are capable at running on speeds up to 16 Megabits per second on copper facilities or 100 Megabits per second on fiber optic facilities.

Mission Critical Application: Some systems, although critical to the agency, may only be of minor inconvenience when they are not available. Office automation products like spreadsheets and word processors fall into this category. A mission critical application is defined as any system that, when not available, affects more than just employee productivity. A mission critical application is a system that directly supports the agency's customers or the people servicing the agency's customers; and a system which, with any extended down time, can affect the health and well-being of the agency's customers or have a significant financial cost to the state.

NCC (The Network Control Center): Located in the State Computer Center in the State Office Building, the network control center provides remote access, monitoring, and management of the state's computer network.

NetWare 4.x: NetWare 4.x is Novell's newest network operating system that substantially differs from older versions of NetWare. It is designed for global enterprise networks, combining multiserver, multiplatform, multilingual networks into a single, secure system that is easy to use and manage. Its Directory Services enables heterogeneous computing environments to be included in an enterprise network. Among other significant

features, its Storage Management Services and Target Service Agents allow the back up of DOS, Windows, OS/2 clients, as well as NetWare servers.

OS/2: OS/2 is IBM's 32-bit multitasking operating system. System requirements are a 386SX microprocessor or higher, 4 Mb minimum memory, 6-8 Mb recommended; 60 Mb or greater hard disk with 20-40 Mb available for OS/2.

PCS/PCN (Personal Communication System or Network): A new type of wireless technology allowing users to un-tether themselves from the traditional land based telecommunication networks. Customers could carry a portable phone with a single number for home or office use regardless of their location. Cellular companies would establish cell sites capable of recognizing the user anywhere in the state or country. These systems would also allow data transfer and communications using cellular modem devices.

PowerPC: Apple, IBM, and Motorola combined their efforts to create the PowerPC, a RISC-based processor which competes with Intel's Pentium-based processor. Apple focused on creating a product that can run both Macintosh and Windows software. IBM focused on building their own PowerPC to replace their RS/6000 line of UNIX workstations.

PBX (Private Branch Exchange): A telephone switch allowing customers within a building or campus to share lines and features. It provides local switching between users of the PBX and routes calls to the various Common Carriers for switching outside of the building or campus. These systems are capable of switching 1,000 or more customers in a common location.

Project Management: Provide the name and phone number of a contact person, IT manager, or project manager; a description of any independent project oversight, such as a steering committee; and any independent quality assurance review, etc.

Project: A broadly defined combination of related activities which support a common objective. Related activities which support a common objective are generally be grouped into one project, not defined as separate projects. For example, several components of a project, such as purchasing work stations and various software packages, securing services related to implementation, and hiring a new administrator should not be listed as separate projects, instead, these should be combined under a broad heading such as "office systems support", with which there will be many activities and acquisitions associated.

Project Priority: A priority level assigned to an IT project. High priority projects are generally those projects which will be completed before lower priority projects. Medium priority projects are generally those projects which will be completed after high priority projects. Low priority projects are generally those projects which will be completed after medium priority projects.

Project Risk: A risk level assigned to an IT project, i.e. the level of risk (impact on programs or services) if the project is "not completed." High risk projects are generally those projects which, if not completed, will have a negative impact on programs or services. Medium risk projects are generally those projects which, if not completed, will have marginal impact on programs or services. Low risk projects are generally those projects which, if not completed, will have no impact on programs or services.

Public/Private Partnerships: Public/private partnerships are alliances between public organizations and businesses and/or citizens to accomplish common goals, the result of which provides something of value to all involved. Following are some examples of public/private partnerships in Utah:

- Utah Valley Business and Education Partnership was created to assure that youngsters are prepared for real work and that technology is used and used effectively within public education.
- Education Technology Initiative, a consortia of public schools and colleges of education, business and industry, and the technology community, was created to develop a world class education environment in Utah.

Quality Jobs/Business Climate: Quality Jobs/Business Climate is one of Governor Leavitt's five key objectives. Some projects which support this objective might include:

Promoting higher paying jobs
Implementing telecommuting for employees
Enabling efficient interaction between business, citizens, and government
Providing access to UtahNet
Providing electronic access to government after hours and on weekends
Providing easy filing of business documents electronically
Encouraging entrepreneurial activity
Reducing restrictions and regulations
Positioning Utah to prosper and participate in the global marketplace

Quality of Life: Quality of Life is one of Governor Leavitt's five key objectives. Some examples of projects which might support this objective include:

- Promote telecommuting
Implement kiosks
Implement smart cards
Increase availability of jobs
Make accessibility to education easier and less costly
Expand health care services in rural areas
Promote flexible working hours

Remote LAN Management Tools: Remote LAN management tools are tools which enable the centralized management and backup of LANs, from desktops to servers, segments, hubs, and services. Network management is more simplified and takes less time, while control is increased, because the LAN administrator can monitor, diagnose, and resolve problems across the network from a single work station.

Security Plan: Provide plans for security, including any plans to:

Ensure the integrity of information.
Protect the privacy of proprietary, personal, privileged, or otherwise sensitive information.
Protect information technology resources from the hazards of fire, water, earthquake, theft, misuse, vandalism, etc.
Enable management to deter, limit, and detect when a hazard has occurred.
Ensure the continued delivery of services in the event of a hazard.
Ensure the organization's ability to recover from a hazard.
Protect employees from unnecessary failure, temptation, or suspicion to default on their responsibilities or in the event that another individual defaults on his/her responsibilities.
Protect management from charges of imprudence if any compromise of security occurs.

Self-Reliance: Fostering SelfReliance is one of Governor Leavitt's five key objectives. Some examples of projects which might support this objective include:

Provide training for everyone
Promote pride in work
Promote job satisfaction
Promote independence
Successfully complete goals

SMDR (Station Message Detail Recording): A device or system capable of tracking calls and providing a report for call accounting and billing systems. Typically, they record originating number, called number, and duration of each call.

Smart/Magnetic Stripe Cards: A magnetic stripe card is the type of card used to enable receiving asset transfers at automated teller machines (ATMs) or a credit or debit card used at a point of sale (POS) recording device when receiving goods or services. If your agency uses magnetic stripe cards for clients to receive services or program benefits, your agency should be considered as using this technology. Do not include the use of state American Express cards in this category.

A smart card must contain an integrated computer chip with memory storage to verify the card holder's identity, allowable benefits, etc. for your agency program clients in order for your agency to be considered as using this technology.

SNA (Systems Network Architecture): An IBM computer network architecture used to connect remote terminal devices to an IBM mainframe computer. These devices communicate using an SDLC protocol.

Software Acquisition Cost: The cost of software required to complete, conclude, or bring a project into full production.

Software Acquisition Detail: Detail any computer software that will be acquired to support the project and provide a justification for unusual or non statestandard products. This information may be entered into a spreadsheet and then inserted into this field, by blocking the information, using CTRL insert to copy the information to the Windows Clipboard, and then SHIFT insert to paste the information into the field.

SONET (Synchronous Optical NETwork): A fiber optic transmission system capable of transporting digital signals from 51.84 Megabits per second to 13.22 Gigabits per second. This is a high speed transmission technology used in a backbone network to combine voice, video, and high speed data over a single fiber optic facility.

State Funds: The total funding for a project from state sources.

Systems Development Methodology: The methodology used to control the design and development of a systems integration project. A systems development methodology is used to control the design and development of a computerized information system. It includes a set of mutually supportive and integrated guidelines organized into a series of chronological phases that make up the cycles of a computer system. Phases generally include: initial investigation, feasibility study, requirements definition, external design, internal design, programming, testing, conversion, and implementation. Each phase will have many detailed tasks to complete the phase. The systems development methodology paints a complete picture of the project plan phases from the initial investigation of the potential need for a new computer system through implementation into production. Examples of systems development methodologies presently used at the state are:

- AMS's Life-Cycle Productivity System (LPS) Package System Implementation (PSI) used for the FIRSTplus project.
- IBM's 3309 Systems Development Methodology used on the ORSIS project.

T1: A network transmission speed of 1.544 Megabits per second capable of combining 24 separate DS0's (56-64 kilobits per second) onto a single, two-pair copper facility with a single electrical interface.

Telecommuting Program for Employees: A telecommuting program is a combination of policies, contracts with employees, and computer hardware and software to enable employees to work from home via remote

connection to office computer systems. Governor Leavitt has a goal of having as many Utah State employees as possible telecommuting by 1996. An agency may refer to the Human Resource Management Rules and/or contact Marlo Wilcox, Quality Director for Human Resource Management, at 538-3649 for additional information. The following requirements must be met:

- The agency must publish a written policy governing telecommuting.
- The agency must execute a contract with each telecommuting employee, specifying conditions and results.
- The program must meet customer needs.
- The program must not violate overtime rules.
- The arrangement must provide identifiable benefits to the state.

TLS: US West's transparent LAN service connecting several large government locations in the Salt Lake Metropolitan area with fiber optics operating at 100 Megabits per second.

TOC (Technical Operations Center): The video operations center located at the University of Utah for administrating, monitoring, and maintaining the statewide video network.

Tools to Improve Efficiency (i.e. STROBE): Many automated tools exist to help improve the efficiency of information systems at the mainframe level (STROBE, Omegamon, etc.) and LAN level (LANalyzer, LANPharaoh analyzer, etc.). These products monitor and analyze processing speed, response time, resource consumption, throughput, and efficiency. Some of them make recommendations for improvements.

Total Department FTEs: The total number of FTEs (full time equivalents) in the department.

Total IT FTEs: The total number of information technology related FTEs (full time equivalents) in the department.

UNIX: A 32-bit multitasking, multiuser operating system developed originally by AT & T's Bell Labs that is based on "open system industry standards". Several varieties of UNIX exist, such as Novell's UnixWare, UNIX System V 4.2, HP UNIX, SCO UNIX, 4.3 BSD UNIX, IBM's AIX, DEC's Ultrix, and several others. All varieties of UNIX should be included in this reporting category. The UNIX user interface is called the shell and the UNIX operating system is mostly written in the C language. The UNIX operating system has a high degree of scalability, interoperability, security, and a large amount of commercial vendor tool support.

Utah Tomorrow: The goals of Utah Tomorrow were adopted by the 1994 Legislature and the Governor, setting in place standards for agencies to use in policy and planning activities. Briefly, these goals include:

Nurture a tolerant, just, and compassionate society.
Educate our citizens.
Build a statewide economy and infrastructure that supports a broad spectrum of opportunity for all citizens.
Enhance our local and global environment.
Promote personal wellbeing.
Broaden our understanding and celebration of the human experience.
Encourage selfsufficiency while helping those with special needs to lead productive, fulfilling lives.
Protect our society.
Assure open, just, and accountable government.
Strengthen our free enterprise system while providing a reasonable regulatory environment that protects our citizens.
Prepare ourselves, our state, and our children for the challenges of tomorrow today.

UtahNet Connectivity: UtahNet is the state's wide area network (WAN). UtahNet is used for electronic mail distribution, electronic file transfers, scheduling meetings and resources, etc. between work stations of state and local government, higher education, public education, and other employees. If your agency is connected to the WAN using either NetWare or INTERNET connectivity, you should report your agency as "already implemented".

UEN (Utah Educational Network): The statewide educational system shared by Higher Education, School Districts, and the Utah State Office of Education.

USOE: Acronym for the Utah State Office of Education.

Video Conferencing: Technology that allows meetings to be held by parties at different locations and allows the meeting participants to see and hear the other participants. It is two-way interactive television used for business meetings or education classes. It also enables interactive exchange of meeting data.

Virus Control: There are generally three categories of anti-virus programs: scanners, monitors, and integrity checkers. Scanners scan executable objects (files and boot sectors) for the presence of code sequences that are present in known viruses. Currently, these are the most popular and widely used kind of anti-virus programs. Monitoring programs are memory resident programs, which constantly monitor some functions of the operating system, functions considered dangerous and indicative of virus-like behavior, such as modifying executable files, bypassing the operating system to access the disk, etc. When a program tries to use such a function, the monitoring program intercepts it and either denies it completely or asks the user for confirmation. Integrity checking programs compute check sums of executable code and store them in a database. Check sums are recomputed periodically and compared with the stored originals to detect virus activity. Evaluation criteria should include: impact on performance and system resources, ease of use, configurability, verifiable effectiveness against viruses, compatibility, false alarm rate, audit trail, and vendor upgrades.

Voice Mail: Equipment that provides functions such as message taking, message storage, message retrieval, and telephone answering. Voice mail is suited to telephone systems where there is "Direct Inward Dialing" and where individual and department telephone numbers are published. When the voice mail box is accessed, the caller's message can be listened to, saved, replied to, or a copy sent to another voice mail subscriber.

WAN (Wide Area Network) (UTAHNET): A broadband data network connected by routers allowing remote data sites to be connected for LAN - LAN, peer - peer, and terminal - host communications over a statewide frame relay network.

WESTNET: The western region of the INTERNET of which Utah is a member.

Wireless Data Technology (800 MHz or mobile data terminals): The 800 MHz wireless data technology provides remote transmission and receipt of digitized data via radio signal. An example of this technology is the proposed use of 800 MHz mobile data computer terminals in Public Safety vehicles (or for peace officers on foot) that would allow transmission/receipt of fingerprints, pictures, etc.

Wireless Data Technology (LAN, electronic mail, etc.): Wireless local area networks allow users to send or receive LAN data without having to install cabling. Wireless LAN transmission technologies include spread-spectrum radio, microcell approaches, and directional/diffused infrared (reflecting signals off walls, ceilings or floors). Wireless LANs are slower than wired Ethernet LANs. Currently, 2 to 5 MB/s speeds are the maximum available. Wireless LANs are also more expensive than cabled LANs, with work station connection costs ranging from $500 - $800 per user. Wireless LANs can operate in the 300 feet - 800 feet range. Wireless LAN standards are set by IEEE 802.11.

WordPerfect Office 4.x: WordPerfect Office 4.x is the state's electronic mail standard. It lets users access electronic messages, personal and group appointments, to-do items and notes all in one customizable interface to make better use of calendaring, scheduling, task management and work flow. Gateways provide access to Novell MHS, SMTP and other electronic mail systems. Office 4.x's newly-designed system administration (Admin) program simplifies the setup, configuration, maintenance, and administration of the system. It allows file access to other platforms and provides an open architecture and printing capabilities.

World-Class Education: WorldClass Education is one of Governor Leavitt's five key objectives. Some projects which support this objective might include:

Distance Learning
Centennial Schools
Access to UtahNet
Access to INTERNET
Video Networks
Training for users of IT resources

X.25: A network protocol providing devices with direct connection to a packet switched network**.**

Windows NT: Microsoft Windows NT operating system is the high-end operating system of the Windows family (it is not Windows 3.1). Windows NT is a full 32-bit, preemptive multitasking operating system with capacity to handle four gigabyte programs. It is designed to work on 486 work stations with at least 12 Mb of RAM.

1FB: Acronym for a single line business phone provided by the Local Common Carrier.

800 MHz: A new frequency spectrum assigned for two-way trunked mobile and portable radio systems.

UTAH LINK

GOALS

1. Link approximately 250 schools via the Electronic Highway wide area network (WAN) over the next three years. This will connect all high schools and middle schools.
2. Provide both initial and ongoing training for the Utah Link users. This will maximize their benefit from the "World of Information" that the system will provide.
3. Provide an initial funding allocation to pay for the line charges to all high schools and middle schools.
4. Fund involvement and delivery of concurrent enrollment programs offered at local public high schools.
5. Fund the application software development and implementation for Utah Link.

JUSTIFICATION

This proposal will allow schools within the state to benefit from the vast amounts of existing data services. In addition, Utah Link will allow education users instantaneous sharing of common interest information such as EMail, library access, INTERNET, and other information resources as they become available.

The budget figures shown below are for the first year of this effort and are calculated based on about 130 sites. The costs are shown in broad budget categories to allow flexibility in actual application. As different implementation options become available, they will be incorporated for the best fit to the local need, cost effectiveness, and efficiency.

BUDGET NOTE: THIS IS THE SAME $ 5 MILLION ON PAGE 8OF THE EXECUTIVE SUMMARY

$ 2.74 MillionHardware: Routers, CSU/DSU, hub infrastructure$ .25 MillionSoftware: Development, grants for applicants' use$. 5754 MillionTraining: In house and grants for applicants' use $ 1.0336 MillionLine charges $ .315 Million"Electronic Age" concurrent enrollment. $ .046 MillionINTERNET access fee$ .040 MillionAdministrative: Supplies, phones, travel, accounting